SIZING UP PEOPLE

Books by DONALD A. LAIRD and ELEANOR C. LAIRD

Sizing Up People

Practical Business Psychology

The Technique of Getting Things Done

The Technique of Personal Analysis

The Technique of Building Personal Leadership

The Technique of Handling People

What Makes People Buy

How to Use Psychology in Business

The Psychology of Selecting Employees

Published by McGraw-Hill Book Company

The Strategy of Handling Children

How to Rest and Sleep Better

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Increasing Personal Efficiency

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To

ROBERT WOOD JOHNSON

Champion of
the dignity of the individual
in modern business

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SIZING UP PEOPLE

To get the most from this book

First —Read the chapter title and WHAT'S AHEAD.

Second—Thumb through the pages of the chapter, looking briefly at the emphasized words and charts.

Then —Start at the beginning of the chapter and read through it carefully, taking time to understand each idea, and to underline important phrases you want to remember.

Follow this plan with each chapter.

Chapter one

HOW TO AVOID BLUNDERS IN SIZING UP OTHERS

WHAT'S AHEAD

Know people—and develop them
Know your prejudices and allow for them
Look for details and disregard general impressions
Take time to form your judgments
Give more attention to past behavior than to appearance
Look for meaningful qualities, not for pet theories

Know people—and develop them

We are always sizing up others, so let us learn how to do a better job of it. Then we can make our daily judgments of people more profitable for ourselves and the world in general.

The receptionist has to make a quick decision about the stranger who has just come in. The newest worker sizes up his boss to figure out how to get on his good side—and at the same time the boss is giving the new employee a once-over. The salesman sizes up the customer before deciding whether to emphasize price, quality, style, or prestige in his sales talk. The executive depends largely for his success upon his correct estimates of associates, customers, and competitors. We are even required to

estimate another person's mood from the sound of his voice over the telephone.

A spokesman for Selfridge & Company, the great London store, said, "The leader in business must make up his mind that the study of human nature is as much his duty as the study of markets and materials, that he should be as much disturbed when he finds he has misread a man as if he had misread a contract."

The Du Pont Company maintains that the success of a business depends upon having the right man in the right spot at the right time. That requires judging men—as well as what the job takes—with some accuracy.

George C. Brainard, president of the Addressograph-Multigraph Corporation, told us, "The success of any enterprise is largely dependent upon management's skill in selecting the right people for the right jobs. The rate of advancement from supervisory to executive levels may be proportionate to the development and use of skill to judge qualifications of personnel for promotion. The importance of ability to judge people cannot be overemphasized, as the need for it, in group effort, is all-embracing."

Carleton H. Palmer, chairman of E. R. Squibb & Sons, has said, "The fundamental asset of any business or of any enterprise is people. The successful executive is he who, by sympathetic understanding and training, accurately assesses people, understands their motives, and knows how to bring out their maximum capabilities."

John Holmes, the messenger boy who became president of Swift & Company, said, "The success of any business hinges on how well it is able to select, organize, equip and train its people—all the way from the bottom to the top."

The best way to have an edge on competitors today is to have better qualified people than competitors have. Companies fre-

quently use identical machinery and buy materials at the same prices, but some of them have an advantage because they have sized up their employees well and put the right people in the right jobs. They have strengthened their organizations by making a trustworthy estimate of each subordinate's potential, and by then helping each to reach that potential. When an employee fails to make good, perhaps it is the executive who has blundered by sizing the man up incorrectly and failing to develop him.

Misconceptions about the abilities or interests of others make trouble in personal life as well as in business. Melinda Miller's mother, for instance, sized up a young Clevelander incorrectly. She decided John D. Rockefeller would never amount to much, and would not permit her daughter to marry him. A few years later Emma Saunders turned him down because she considered him a poor social risk. Unhappy marriages and divorces are often due to errors in judging others.

Many young people are forced into unsuitable occupations, or kept from their best work, because parents, teachers, or employers size them up wrong. "You have no talent for the piano. Your hands are the wrong shape, too," a teacher told Paderewski, who was to become the world's premier pianist.

"Your boy will never learn to keep store; better take him back to the farm," a country storekeeper told Marshall Field's father. A dozen years later, when young Field was a partner in Chicago's fastest growing store, the old storekeeper wouldn't believe it. "Must be something fishy about it," he said. The fishy part, of course, was his own incorrect estimate of the young boy's potentials.

Why do you think it safe to lend money to one person, but not to another? How sure are you that you have picked the best physician for you? Or lawyer? Do you think that cashier will try to shortchange you? How can you be sure your teen-age child may be trusted to drive the family automobile? Do you

sometimes vote for candidates who fail to fulfill your expectations? Do you sometimes say things that offend another when you had intended to please him?

In daily life most of us size up other people incidentally, without making an effort to verify our hunches about them. As a result, most judgments of character are no better than guesswork, as many experiments have proved. Furthermore, important qualities can be overlooked as easily as minor ones. An employee can be insane, for example, yet his foreman and relatives may not realize it until some violence is done. Sometimes employees who are sized up as trustworthy embezzle thousands of dollars before they are even suspected. Such common blunders, or oversights, in sizing up people make life—and work—needlessly rough.

More and more business leaders are now making an effort to come closer to the mark in sizing up people. Some companies are training executives, supervisors, and employment interviewers to judge people better, with resulting decreases in labor turnover and boosts in production. Such training is essential not only because sizing up people is important, but also because many of us have notions about reading character which lead us to the wrong conclusions. This book will present in everyday words the rules and facts which are taught in these training courses.

At the outset we must become familiar with five great rules for avoiding blunders in sizing up and developing others.

Know your prejudices and allow for them

This is the first rule.

Frank Munsey was a telegraph operator from Maine who went to the big city and became a big publisher. A sparsely built, hollow-cheeked man himself, he distrusted fat people and would

not hire a fat man. Just a prejudice. A key editorial worker on one newspaper Munsey bought was a 300-pound Bulgarian. As soon as Munsey saw this man-mountain he said, "Fire him; he's too fat."

But brilliant Svetozar Tonjoroff was not fired; those who knew his real abilities put him on the pay roll under another name and kept him in hiding when Munsey was in the building. It was Tonjoroff who discovered the novelist Joseph Conrad, and who was later Balkan correspondent for the Associated Press. Publisher Munsey wanted none of him simply because he had a thin man's prejudice against fat folks.

Most of us have similar prejudices which cause us to favor one person and discredit another. Some executives are prejudiced against engineering graduates, favoring self-taught mechanics instead. Some are for men with deep voices and against tenors. Others favor pipe smokers and suspect those who dislike fishing trips. The "sizing up" which is done in such cases is nothing more than exercising one's prejudices.

Prejudices sometimes arise from unpleasant experiences, but more often they are due to a bias in favor of people like ourselves. The executive who is a self-taught mechanic is likely to be against engineering graduates. And the executive who is an engineering graduate may spurn graduates of liberal arts courses. (There is a section on prejudices in our book *Practical Business Psychology.**)

Here is a list which one employment interviewer made of the prejudices that were misleading him in sizing up people. He was not aware of the part played by prejudice until he sat down to analyze his reactions. He found that he tended to estimate unfavorably:

* *Practical Business Psychology* published by McGraw-Hill Book Company, Inc., New York, 1951.

People who wear bow ties
People with pimples
Rapid talkers
Prohibitionists
People who read tabloids
Tall people
People with loud-colored fingernails
People who tug at ear or clothes
People with short mustaches
People with big ears
People who do not stand erect
People who wear "school marm" eyeglasses

You probably can't get rid of all your prejudices. But the first step toward improving your judgments of others is to recognize some of your pet peeves, and to make allowances for them when sizing up people.

Look for details and disregard general impressions

The natural inclination to like or dislike a person on first meeting twists our estimates of his potentialities. If we dislike him, we look for signs of poor ability; if we like him we look for good points. The best preventive for this source of error is to form the habit of looking for strong points in the person you disliked at first, and for weaknesses in those to whom you feel attracted. Otherwise, the halo of your personal reaction will make your sizing up pure speculation.

Avoid forming a general impression, if you can, and concentrate on details instead. Observe the other person's eyes on first meeting, for instance. Are they shifty, or do they look steadily into your eyes? Shifty eyes do not mean that he is evasive or dishonest, as is widely believed, but they do mean that he is likely to be more submissive than average. A direct and piercing gaze, on the other hand, indicates aggressiveness. The more you know about which significant details to observe, the better your judgment.

Details of clothing will suggest whether the person leans toward the conservative or the flashy—but will not tell whether he is neat in keeping books.

One rainy afternoon a smallish woman wearing a nondescript raincoat went into a furniture department. The salesmen were chatting with each other. "She's not going to buy anything," one of them said, "she's too frowsy; just wants to look around." But a younger man did not let the general impression mislead him. He spent an hour showing her furniture and explaining its fine points. She left without buying, and the other salesmen said, "We told you so." A few months later the store received a cable from Scotland, asking that the young salesman be sent to help select furnishings for Skibo Castle. It was signed by the woman in the frowsy raincoat, Mrs. Andrew Carnegie.

Take time to form your judgments

People can seldom be sized up fully on sight, for they don't show all their traits at once. On first meeting, they are usually on good behavior and conceal unfavorable qualities, such as a streak of stubbornness. A few may be plagued with nervousness and therefore fail to show up at their best. One skilled interviewer tells nervous persons to walk briskly around the block and come back; the exercise helps them forget to be jittery.

First impressions last with the amateur, and mislead him, as do general impressions. Take your time—don't jump to conclusions. Avoid the blunder of snap judgments by making your first estimate tentative. Then look for signs that you may be wrong. Don't try to confirm your first impression, but challenge it.

Edward M. House, influential figure in the Woodrow Wilson era, said, "I have found that if you allow yourself to become enthusiastic about a man on first meeting, when you do come to know him he will seem disappointing. And that is as much your fault as his." Colonel House was skilled in sizing up and handling others.

Henry II, of England, was looking for a chancellor. Thomas à Becket, son of a prosperous merchant, was highly recom-

mended for the exalted post. On first meeting the tall, slender man, the king fell under the spell of his piercing dark eyes (aggressiveness), and his impulse was to make Becket chancellor right then and there. Yet Henry did not completely trust his quick impression, so he cautiously tried Becket out in lesser posts where it was possible to study the man's abilities, tempering his first enthusiasm to watch the man at work. If Henry II's son Richard, the Lionhearted, had followed his father's cautious example and sized up his chancellor more carefully, too, England would have been spared much misery. Richard appointed a little unknown hunchback, Longchamp, and left at once for the crusades. Longchamp ran the country ruthlessly, decking himself out like a king, squeezing every tax penny from the country, and bragging about the harshness of his rule.

Sizing up should be a continuing process, not something to be finished on first meeting. Keep your eyes, and your mind, open. The British novelist, Israel Zangwill, commented that "the only true love is love at first sight; second sight dispels it." Especially in sizing up personality traits, a second look is advisable. Many people are cycloid in make-up, going through a cycle from happy to sad, or from active to passive. One interview may indicate that they are optimistic, while a week later they may be in a pessimistic mood as their cycle shifts.

Top executives have to study the abilities of their key men continuously. A promising man is often given unusual assignments, as rough-and-ready tests of his potentials. Walter Gifford, as president of the American Telephone and Telegraph Company, did this with young Leroy Wilson, observing the engineer in nonengineering work for several years before deciding that Wilson was the man to take his place as president.

A critical weakness of common employment methods is lack of time; the average employment interview lasts only twelve minutes. In addition, the average interviewer has only two years

of high school education, and lacks the special training which might help him to observe significant details and analyze them quickly. He bases his decisions on inaccurate general impressions. It is not surprising that the right man in the right place at the right time is a matter of luck in many firms.

Give more attention to past behavior than to appearance

Appearance is to be considered for some types of work, but is no indication of ability. People may be beautiful and dumb, and they may be beautiful and brainy. An entertaining demonstration of how misleading appearances may be was made with pictures of a railroad president, a university dean, and a good-looking imbecile, each of whom wore a dinner jacket and black bow tie for the photograph. More people picked the railroad president as the imbecile than picked the imbecile himself.

Many experiments have proved beyond doubt that the shape of the face tells nothing about abilities. A bulging forehead does not mean that a person is a great thinker. A receding chin, according to folklore, indicates a weak will, but Colonel E. M. House, who was stronger willed than most men, had almost no chin. Fat people do not necessarily have good dispositions; fat Samuel Johnson, the dictionary-maker and famous conversationalist, was as bitter and faultfinding as he was fat and brilliant.

Complexion and hair color tell nothing about personality, either—unless a woman dyes her gray hair or a man conceals his baldness under a toupee. A few sales managers think blonds make the best salesmen; but studies show that coloring has nothing to do with sales success.

Past behavior is a better indicator of what a person will be likely to do in the future. The young man who had good grades in arithmetic is likely to be a better invoice clerk than

the one who had poor marks and left school after the seventh grade. We are justified in suspecting that the person who had trouble getting along with teachers will have trouble getting along with boss or wife. The girl who has been flirtatious in the past is likely to keep on, despite the bonds of matrimony. The man who has been hotheaded is likely to be the same way in the future—and redheadedness tells nothing about his temper. The person who has been late for appointments will likely keep on being late.

There is a basis for sizing up people in the fact that one is about the same kind of a man that he was a boy. People may grow larger in size, but they are seldom motivated to grow out of their past habits. Learn about past habits as an indicator for the future.

Look for meaningful qualities, not for pet theories

One executive, who imagines he is a great character reader, makes a practice of asking for a pencil. If the person cannot produce one instantly, without fumbling, the executive concludes he is an unsystematic person. This conclusion is not justified in the least.

Some interviewers like to drop a pencil, and if the other person picks it up, they conclude he is of the helpful type. It doesn't follow.

"Hang up your hat and sit down," says another, when there is no hook or chair in the room. He imagines this will show whether the other fellow has initiative and self-reliance.

"What did you have for dinner last Sunday?" another asks under the mistaken belief that the answer will show whether the person has a good memory. There are at least four primary memory abilities, and one could remember all about that meal without having a good memory for names and faces, for instructions, or for the new price lists.

Many judgments of people are made on pet theories like these, which are meaningless. There are, however, proved primary mental abilities, primary temperamental qualities, and basic-interest groupings, which are the foundations of human make-up. In sizing up others we must know about these real ins and outs of human nature.

Sales ability, for instance, is not a definite trait. Instead, there are some primary temperamental qualities, such as aggressiveness, and some basic-interest groupings, such as liking to be with people, which the prospective salesman needs, as well as some primary mental abilities, such as remembering names and faces. You should look for such primary characteristics, rather than their end result in so-called "sales ability," "mechanical ability," or what not. Much of this book is devoted to primary characteristics.

To improve in the art of sizing up people

Take these easy steps in the beginning:

Step 1—*Know your prejudices about people,* and then discount or correct estimates in which these prejudices might be at work. Keep your likes and dislikes out of it.

Step 2—*Observe details* and avoid being misled by general impressions.

Step 3—*Observe steadily* and change your estimates as often as necessary. Give up the notion that you can size up on sight. Make sizing up continuous, not something that stops after the first meeting.

Step 4—*Study past behavior,* not bones or complexion.

Step 5—*Size up with regard to primary qualities,* not superficial characteristics. Get down to the bedrock of human nature.

Chapter two

THE WAY TO JUDGE PEOPLE

WHAT'S AHEAD

Psychologists' skill in estimating people
Look for detailed characteristics
Use reasonable standards
Estimate how much he has of a quality
Get the other person to do the talking
Know why you estimate him high, average, or low

Psychologists' skill in estimating people

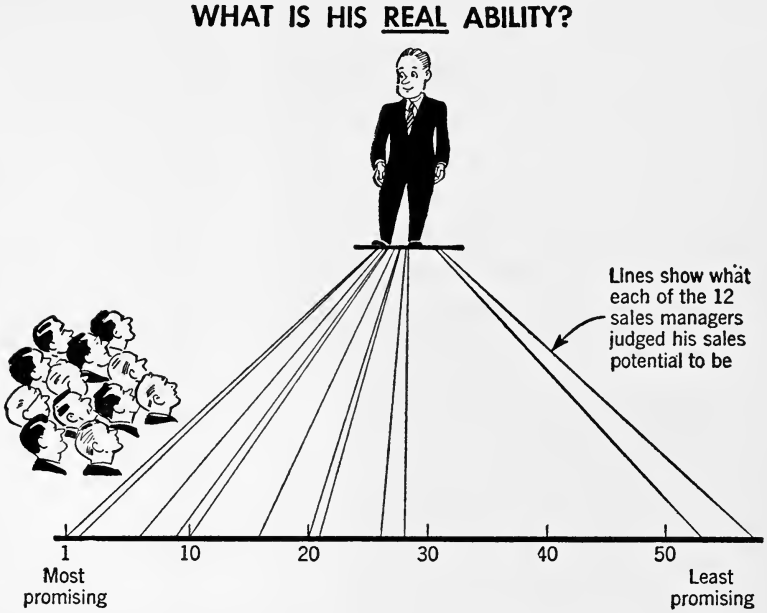
"What is wisdom?" Confucius was asked 2,500 years ago.

"To know mankind," he replied. That is the kind of wisdom needed to size up people.

Knowing the ins and outs of human nature is the business of psychologists. They are the experts in sizing up people. However, they do not have a monopoly on knowledge about human nature; anyone can pick up a useful amount of information which will improve his ability to estimate people.

The way psychologists analyzed Hitler for the United States government is an interesting example of what can be done in sizing up others, even from a distance. It was impossible for them to examine the Nazi dictator face to face, but there was much information available about his past behavior, and from this psychologists correctly forecast that Hitler would commit suicide.

Psychological experts agree closely in sizing up people. Some 500 officer-training candidates for the Coast Guard, for instance, were examined by two psychologists and a psychiatrist of the United States Public Health Service (Drs. Sidney H. Newman, Joseph M. Bobbitt, and Dale C. Cameron). Each candidate was



Twelve sales managers sized up one man with this wide disagreement about his potential for sales work. One manager judged him most promising, another least promising of the 57 applicants. (Data from Dr. Harry Hollingworth.)

judged on his likelihood of passing the course and fitting into the pressure of service life. No mental tests were used, and each examiner formed his conclusions independently. When their judgments were compared later, there was a close agreement between them—the correlations were 0.85. A perfect correlation would have been 1.0, and no correlation 0.0. Very few correlations are higher than 0.5. In the experiment described in the

following paragraph, the correlation of the salesmanagers' estimates was 0.0—or pure guessing.

In one famous experiment 20 sales managers interviewed two dozen applicants for sales work. Each manager sized up each applicant independently, and then ranked the 24 from best to poorest. The sales managers' results were not consistent, the average agreement being little better than chance. Applicant Smithers, for instance, was judged second best by one manager, but poorest by another. However, two professional psychologists also sized up these sales applicants. Although no tests were used, the two psychologists did a more consistent job than any of the 20 experienced sales manager. These psychologists were Dr. Walter Dill Scott, later president of Northwestern University, and Dr. Guy M. Whipple, author of a mental test manual. In the chart "What is his *real* ability?" you can see from another experiment how poorly 12 other sales managers agreed in lining up 57 applicants.

Facts such as these have led many corporations to employ consulting psychologists, who select key personnel and give psychological training in judging people to their executives, from foremen up. In such training, at the outset, the following five important rules are taught.

Look for detailed characteristics

The amateur's sizing up of people usually consists of a simple conclusion that the other person is "good" or "bad." This is an ethical decision, not an estimate of abilities. The judge is sidetracked by his own moral notions when he thinks of "good" or "bad."

Blanket judgments of that sort tell nothing about detailed abilities or characteristics. They are conclusions rather than descriptions.

The good judge of people will avoid approval or disapproval.

Morals are important in one's life and work, but censure or disapproval of others may cause countless errors in sizing up human qualities. Letters of recommendation from clergymen are often discounted when a prospective employee is under consideration, because they are thought to be concerned not with estimating the man's capabilities but with passing judgment on his moral worth.

People should be sized up on trustworthiness and moral character—but that should be done after their specific abilities are impartially estimated.

Use reasonable standards

An early step in training foremen to make merit ratings of workers is to gauge each foreman's individual tendency to be "hard" or "easy" in sizing up others. The top-notch mechanic is likely to use too high a standard for judging mechanical skills. The brainy person is likely to be too severe in estimating intelligence.

We tend to use ourselves as standards of what is desirable when making estimates. On such a basis, *I* would rate anyone who can carry a tune as having great musical ability, or an average bowler as a great athlete. As Madame Swetchine, the influential Russo-French author, said, "We do not judge men by what they are in themselves, but by what they are relatively to us."

Estimates should be made with reference to the average man and woman, not to the judge's own abilities. This requires a wide observation of human nature and a more exact knowledge of what is average—knowledge which can be gleaned from a study of psychological writings. It is necessary to know what par is.

If you judge more than one-third of people as below average in the long run, you are being too hard, and if more than one-third as above average, you are being too easy or generous.

The Metropolitan Life Insurance Company keeps its general agents from being too "hard" or "easy" in rating their agents by instructing them that rating should be apportioned about as follows:

Rating	Per cent who should get each rating
Distinctly superior	4%
Considerably above average	7%
Moderately above average	12%
Slightly above average	17%
Average	20%
Slightly below average	17%
Moderately below average	12%
Considerably below average	7%
Distinctly inferior	4%

That provides nine degrees for sizing up individuals, four above and four below average.

The hotel lobby or country club is not the place to see what average people are like. Neither is the pullman car or airplane. Go to the interstate bus station to see hundreds of average people. Look at the dress of these people. Listen to what they talk about, and how they talk. Watch what they read, or how they spend their idle time. Notice indications of confidence or uncertainty, of helpfulness or selfishness, of quickness to understand or bewilderment. You may have to revise your standards of what is average.

Estimate how much he has of a quality

People are not musical or nonmusical, creative or noncreative, cooperative or noncooperative. There are a dozen degrees of cooperativeness, or musical ability, or of any human trait. Even I can murder a song with enjoyment, so my musical ability is not entirely absent.

The amateur character reader usually overlooks the fact that

people have more or less the same abilities, but in varying degrees. We are alike in the kinds of qualities we have; the differences are in the amount we have of each. Start to think in terms of how much. For practice, think of someone you know slightly, and estimate how cooperative he may be. Estimate at the outset in only three degrees: above average, average, or below average.

With more practice, five degrees can be used:

Very high
Above average
Average (the bus station)
Below average
Very low

As experience is gained, more than five degrees can be used. In the study of Coast Guard officer candidates, for instance, the experienced psychologists judged each characteristic in thirteen degrees.

The degrees seem more tangible when you think of actual people and place them along a scale. In one department store, for instance, section chiefs sized up their sales girls on pleasantness by writing the name of the most pleasant at the top of a sheet of paper and the least pleasant at the bottom. Then the names of the other girls were written somewhere in between, and when the list was finished the girls were arranged from the most pleasant to least pleasant, just as they might have been from tallest to shortest, or from fastest to slowest. The girl at the middle of the list was average on pleasantness for her section of the store; but she was still much above average for pleasantness in the general population (the bus station) because the sour-faced girls with dill-pickle dispositions had not been hired in the first place. The section group probably did not include a girl who was below the general-population average in pleasantness.

The amateur judge notices only that people are pleasant or not pleasant, and misses the many in-between points. Begin now to watch for *how much* of all human qualities and form a mental picture of what is average, or par, for each quality in the general population, and what the range is from top to bottom. Then place people somewhere along this range.

Get the other person to do the talking

You can't learn much about another person by monopolizing the talk yourself. Except for small talk at the beginning of the interview to make him feel at ease, concentrate on experiences and attitudes of his which may indicate significant characteristics. Give him a chance to brag, to complain, to lie, to gesture and move about. Make mental notes of whether he does these more (or less) than other people, so you can place him along your scales.

Keep to yourself any feelings you may have of disapproval or approval. If he catches a disapproving expression on your face, he is likely to change his story. And if you feel either approval or disapproval you may make moral judgments and miss sizing up his real qualities.

Lead him out, but don't tip him off.

Know why you estimate him high, average, or low

If you cannot give three reasons for your estimate, it probably reflects your own bias or a meaningless general impression. To say "he lacks aggressiveness" is to say nothing. For one thing, he doesn't lack it—he may have a tiny amount of it, or he may be as aggressive as the bus-station average. The judger may be comparing the man's aggressiveness with that shown by a go-getter stock promoter, or he may have frightened the poor

man so that he drew into his shell and merely seemed to lack aggressiveness in front of a domineering personality. But one can have some confidence in an estimate which is analyzed in this way: "Seems below average in aggressiveness; indicated by an evasive glance, talking only when questioned directly, and the fact that he turned down an opportunity to start his own office-machine repair business last year."

Have at least three such definite reasons before you estimate a person as high, average, or low in any quality.

"Frank is ten times better than John," someone says. The differences between people are not so large as such off-the-cuff comments suggest. In the Coast Guard experiment the officer candidates were estimated on a scale of 1 to 13, but that does not mean that one aspirant had 13 times the ability of another; it shows how trained observers can notice small differences when the total difference is not large.

Close observation and definite reasons are essential when sizing up people, since the small differences are not always obvious. To be able to detect several grades of small differences takes (*a*) training and practice, plus (*b*) knowing what significant details to look for.

There are plenty of opportunities to practice the art of sizing up others, for the whole world is a laboratory. We are always "taking the measure" of others, anyway; to make this practice count we need to be more scientific about it. In the first chapter we outlined five concrete steps in this direction. To these we can now add five more:

Step 6—Look for characteristics, do not judge as "good" or "bad."
Step 7—Use reasonable standards, do not be "hard" or "easy."
Step 8—Get the other person to do most of the talking—and on topics that reveal his characteristics.
Step 9—Estimate how much he has of each characteristic.
Step 10—Know *Why* we estimate him high, average, or low.

There is no inborn knowledge, or instinct, which tells people how to read character. It has to be learned. There's no use fooling ourselves that sizing up people "just comes naturally." The average person's judgments of people—including his estimates of himself—are little better than guesswork. The girl who was demoted from her receptionist's job because she was too sarcastic thought she was only being frank and honest. The salesman who couldn't earn his drawing account imagined he was a great storyteller, but everyone else said he dragged out stories in a boring manner. The quiet auditor who felt he was unpopular in the office was really highly popular but others showed restraint and respect for him because of his reserved manner.

While no one can become an infallible judge of people, a person who has enough general intelligence to finish high school can become as accurate in reading what people will or can do as he is in reading the signs which forecast the next half day's weather.

The professional weatherman's forecasts are more accurate than the amateur's. The professional uses scientific instruments, studies reports from all over the continent, and watches scientifically proved weather signs. He doesn't go by a general feeling in his bones or by the kind of weather he would like to have.

It is much the same with a professional psychologist in forecasting human performance. He can use mental tests and compare the score with scores from all over the country. Some 60 million mental tests are used each year, about 12 million of these in business and industry. He also observes behavior during the tests, because the way the person tackles them may be as revealing as the final score he makes. But the use of mental tests requires special training; they are available only to qualified persons and are not used by mail. The average person has to be adept in sizing up others without the use of tests. He can't

spend the two or more solid years of graduate study needed to qualify for using and interpreting tests. Moreover, he has to make many daily decisions about people on the run. These decisions will be vastly more useful when he knows what to judge and how to judge it quickly.

Now we will turn to some of the ins and outs of human nature which are important in the workaday world, to human powers and abilities you need to understand so you may size up people better. But always follow the ten rules given in these first two chapters as you size up the fundamentals of human nature described in the remainder of the book.

Chapter three

HOW PEOPLE DIFFER

WHAT'S AHEAD

Sir Francis Galton and the personal equation
The "shortchange" in human nature
Individual differences in build
Differences in muscular abilities
Differences in mental abilities

Sir Francis Galton and the personal equation

Have you ever wondered, "What does a $75,000-a-year executive have that I haven't?"

We can answer that, thanks to a host of experiments started by one of the brainiest and most interesting people in history, Sir Francis Galton. A banker's son, Galton could read English when he was two and a half years old, knew the multiplication tables at five, and read Greek and Latin at six. He had money and brains, and used both diligently to originate studies on how people differ from one another. Measuring mankind to find facts which would throw light on human evolution, together with the development of superior abilities, was his consuming interest.

He set up a laboratory on his estate where he invented many kinds of instruments to measure the *personal equation,* or differences in sensory keenness, memory, speed of movement, and strength. He put an adjustable whistle on the end of his walking stick to test animals' hearing at the zoo. Differences in mental

imagery were discovered by Galton. He invented the first mental tests. And, for good measure, he tried to find what mental disorder was like by making himself imagine that people—and horses, too—were spying on him; fortunately, he could not drive himself out of his mind.

The rush of experiments, which are the foundation for the 60 million mental tests used in the United States each year, was started by Galton. His book *Inquiries into Human Faculty and Its Development* was published in 1883, and when he died in 1911, at the age of eighty-nine, he left his fortune to a laboratory to carry on the work of individual psychology. Plato had said, "Citizens, you are all brothers, yet God has framed you differently." Galton and his successors measured those differences, even to the tips of fingers.

The "shortchange" in human nature

"What does a $75,000-a-year man have that I haven't?"

Not a single thing which you do not possess in *some* degree. People are *alike in the kinds* of abilities and capacities they have. The differences are in the amounts.

We have all been shortchanged on some qualities, and "long-changed" on others. People are not just "average, all-around folks." They have a little more of this and a little less of that. Their abilities may waver around average, or above average, or below average, but they waver with high spots and low spots. As G. K. Chesterton wrote: "There is no big man really clever who has not found out that he is stupid, no big man who has not felt small." Daniel Webster's high school teacher said, "Your Latin is no great thing. Your Greek is worse. And your geography? Oh, fie! But you have the gift of gab. You'll make a glib tongue carry a lame mind."

Some people have the idea that when nature shortchanges

an individual in one respect, she makes up by giving him an oversupply of another ability. This is the old *theory of compensation for weakness,* and it is not true. Nature is not so benevolent. As far as inborn abilities go, the cards are stacked at birth in a rather random fashion, with strong suits and short suits; no extra aces are tucked in when it is a short suit.

People who are born blind accomplish near-wonders with their sense of touch, as do deaf persons with lip reading. Experiments have shown, however, that blind people's sense of touch is no more acute than other people's. They have merely learned to make better use of it. The apparent compensation is from individual effort to make better use of other abilities.

A shortchange sometimes produces a motivation toward improvement, which explains why some people who are born on the wrong side of the tracks exert themselves and go farther in the world than some children of wealthy families who do not feel they have been shortchanged.

If a person has great ability in one respect, does that mean he has been deprived of others? Is the genius a bit goofy in some respects? Actual records do not bear out these popular notions. Geniuses are not usually deprived of any ability. A great man's few shortchanges merely seem greater than those of the average person because of the brilliance of his specialty.

Geniuses, and $75,000-a-year men, are like the rest of us, only a little more so. At the other extreme, the feebleminded are like the rest of us, only a little less so. Just how much is "a little more so" and "a little less so"?

Individual differences in build

Justice Oliver Wendell Holmes was 6 feet, 3 inches tall. His father was 5 feet, 5 inches. When they walked side by side people smiled, for the son looked like a giant, the father like a pigmy. Yet there was less than a foot of difference in their

heights, and neither father nor son varied much from the average American man's height of 5 feet, 7½ inches. Many individual differences *seem* greater than actual measurements indicate, and they are likely to seem greatest to the person who is excelled by others in some regard.

Dr. David Wechsler, professor of medical psychology at New York University's college of medicine, has summed up thousands of physical and mental measurements, and reports that the ratio between the heights of the tallest person and the shortest person is 1.28 to 1. (This omits the very tallest one and the very shortest one in each 1,000 people, on the assumption that they are "freaks of nature.")

Differences in other physical measurements are not much greater than that for height. Yet those slight differences do affect working efficiency. The "average" desk height is too low for a tall person, too high for a short one. Desk and bench heights are right for only about half the people who use them, and the other half should have adjustable chairs so they can work comfortably. (But who ever knew of an adjustable chair that did have its height adjusted?)

The United States Air Force has discovered that some pilot fatigue is traceable to the "average" seat in planes which does not fit individual differences in build. Under the direction of Dr. H. T. E. Hertzberg, thousands of measurements have been compiled and specifications developed, not for one "average person," but for three average persons. Adjustable plastic manikins have been built to these three sizes and are used as a guide for cockpit dimensions to assure adequate elbow room and seating space. Slight as these physical differences may be on a ratio basis, they are of enough practical significance to make the so-called "average person" turn out to be three average people—even for the length of umbrella handles.

Most tools and working equipment are designed for that

mythical "average person," and as a result about half the population finds that scissor handles and many other tools do not fit their fingers. Walter P. Chrysler, who was a big-boned man with big hands, made a complete set of tools to fit his own anatomy when he was a young mechanic.

Howard Snyder, an inventor, was a short man, 5 feet, 3 inches tall. He was working with Fred L. Maytag in developing a new kind of home washing machine. Mr. Maytag was 6 feet, 2 inches tall and got a pain in his back from trying to use the washing machine which inventor Snyder thought was just the right height. As a result, the machine was equipped with adjustable legs.

Designing working equipment and space to match individual differences in dimensions is now called *human engineering.* Employment interviewers use the human engineering approach to try to place applicants at work which will fit their builds.

Differences in muscular abilities

The differences between people become greater when we study them in action. In pulse rate the ratio is 2 to 1; Napoleon had a pulse rate of only 50 per minute, Paavo Nurmi, the distance runner, 46; and Gunder Hägg, another distance runner, only 48. Blood pressure varies among people on a 2 to 1 ratio, also. The ratio is also 2 to 1 for such easy voluntary muscular activity as the speed at which one can insert bolts in assembling, stringing buttons, and tapping, and for speed of handwriting.

According to this ratio, some factory workers should be able to turn out twice as much easy muscular work as others, and sometimes that happens in a department. Usually there is not this much difference in production, for three reasons: (1) Workers have been chosen so the clumsier or slower are not placed on the work. (2) In many firms the more agile worker

either holds down his output, or may actually slip some of his production to the credit of the slower worker. (3) In some instances machines set a limit which keeps the speedier worker from turning out all he might.

Differences in mental abilities

The higher up the scale we go, the greater the differences in abilities. The range in mental abilities is around 3 to 1. Simple mental abilities, such as the number of numerals one can remember, are a little below this 3 to 1 ratio. Intelligence quotients are exactly 3 to 1—the difference between the top general and the private who is too dull to learn "squads right." Difficult learning shows a slightly higher ratio between the best and the poorest.

So the difference in intelligence between the three-nickel-errand moron and the $75,000 executive was only a 3 to 1 ratio after all. Not much difference—but what a whale of a difference it makes to the world!

These ratios may seem absurdly small until we realize that a little more of an ability may bring increased returns in geometrical ratio. There are only a few points of difference between the intelligence quotient needed for a foreman and that needed for a plant manager, but if the foreman does not have those few points he will most likely fail as manager. Some companies have learned this the hard way when the plant manager left and they discovered they did not have a foreman who had the qualifications to take over the vacant job.

For example, the Psychological Corporation recently studied the six plants of a large organization which was stagnating. Only one of the six plant heads had more mental capacities than his present job called for; none of the others were promotional material, and some of them already had jobs too big for

their brains. The psychologists helped top management select new plant executives who had promotional possibilities, thus taking care of the future needs for higher executives.

Chapter four

HOW HUMAN ABILITIES ARE GRADED

WHAT'S AHEAD

How ability is distributed
Quartiles and percentiles for comparing people
Relating ability to the job
There is no average person

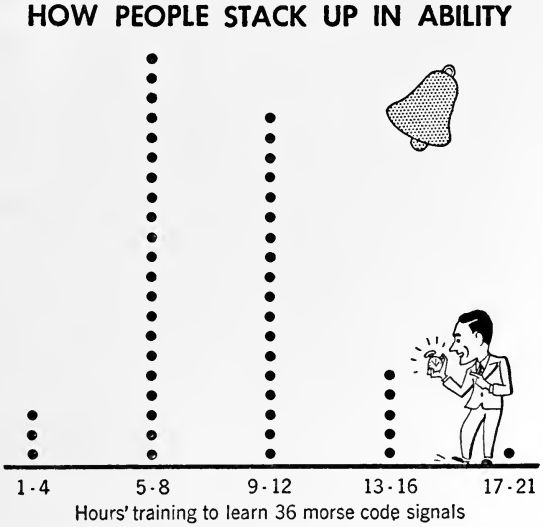
How ability is distributed

"In proportion as our own mind is enlarged we discover a greater number of differences between people. Commonplace people see no difference between one person and another." So wrote Blaise Pascal, the French scientist, in 1650. Plato, centuries before Pascal, had observed, "There are few superior men, and few inferior, and the great majority are between the two." We are inclined to divide people into two extreme groups, the tall and the short, the fast and the slow, the capable and the incapable. Even though we know there are so-called average people, midway between all extremes, we often watch the extremes when we should keep our eyes on the in-between points.

Differences in abilities do not fall into clear-cut groups. Nature has provided an infinite gradation from one extreme to the other of every human quality. Take slowness as an example:

About 7% of people will be very slow
24% of people will be a little faster
38% of people will be "average" in speed
24% of people will be faster than "average"
7% of people will be still faster

Such a *normal distribution,* with its infinite gradations from each extreme to a large grouping in the middle, holds for other



Individual differences in learning. The dots represent 48 individuals grouped according to learning time. To make a curve of this, take pencil or ink and draw a line from one top dot to the next. (Data from Dr. Fred S. Keller.)

human qualities and traits. Height, weight, sensory acuity, learning capacity, intelligence, musical aptitude, executive ability—all follow the normal distribution curve. Very few individuals are at the extremes, most are midway between them.

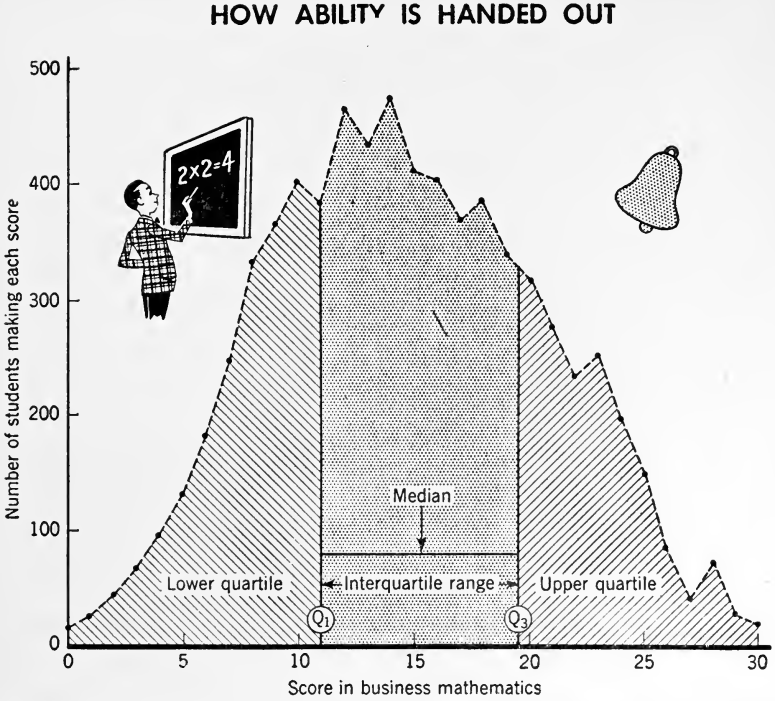
The chart on "How people stack up in ability" shows the distribution of speed in learning the Morse code among 48

young men. This chart is a *frequency distribution;* it shows the frequency with which the various learning speeds were distributed among the individuals in this small group. Three learned the code in from 1 to 4 hours; one took more than 17 hours. We might call the men at these extremes the fast and slow code-learners. But notice that most of the men are between the extremes. The employment manager wants to hire those from the fast-learning end, but he will have to scout through thousands of applicants to find many fast code-learners.

Let's look at the individual differences in a larger group. The chart on "How ability is handed out" shows how ability in business mathematics was distributed among 7,196 beginning students in accounting. By connecting the top dots for the individuals stacked at each score on the test, we have a curve that resembles the outline of a bell. The *normal distribution curve* is always somewhat bell-shaped. When a distribution curve is not somewhat bell-shaped it means either (1) that the measurements have not been made properly, or (2) that the group is not a representative sample of human nature.

Quartiles and percentiles for comparing people

There are some handy terms to describe an individual's standing along the normal distribution curve which you will need to know if you do any technical reading, especially on employment psychology. The curve is divided up much in the same way that a dollar is divided into quarters, dimes, and pennies. The division into quarters is shown in the chart on "How ability is handed out." The shaded portion at the left of the curve includes the poorest 25 per cent of the students. This quarter is called the *lower quartile,* ranging from the equivalent of a penny to 25¢ in score. The shading on the right marks off the best 25 per cent and is called the *upper quartile,* ranging from



Individual differences in business mathematical ability among 7,196 beginning students of accounting in 99 schools. The dots have been omitted except for the ones at the top of each column, which are connected to form the *distribution curve*. The average, or *median*, is shown by the arrow. Half the students are included in the *interquartile range*. Ten per cent made scores less than 8, and are said to be in the lowest decile. (Data from The American Institute of Accountants.)

75¢ to $1. Half the students are between these extreme quartiles, and are said to be in the interquartile range, that is, in the two middle quartiles.

It takes only three scores or measurements to separate a group into four quartiles. The score separating the lower from the

second is indicated by Q_1. The second and third quartiles are separated by the *median* or midpoint which is Q_2. The third and upper quartiles are separated by Q_3.

Here is how quartiles are related to some everyday terms:

High.....Upper quartile
High average.....Third quartile
Low average.....Second quartile
Low.....Lower quartile

Saying that so-and-so is in the top quartile covers a wide range of ability, for there can be considerable difference between people in the same quartile. Einstein and an average college teacher are both in the upper quartile in intelligence, but there is a great difference between them.

Deciles are sometimes used to make finer distinctions between people. Deciles divide the range between top and bottom into ten sections—like a dime—each section containing 10 per cent of the people. Only a few college teachers would be in the same decile with Einstein in intelligence.

Percentiles are the smallest units for comparing individuals, and are equivalent to pennies. There are 25 percentiles in each quartile. A percentile tells the percentage of people one excels—not the percentage of correct answers on a test. Notice the scores along the bottom of the chart on "How ability is handed out." A student who scored 7 on the test is in the 10 percentile—he did better than 9 per cent of the group, and was excelled by 90 per cent.

High and low percentiles represent greater differences than percentiles in the midrange. In the lower quartile on this chart the scores range from 0 to 11; therefore, each of the 25 percentiles in this range differs from the next one by about half a score on the test. In the interquartile range, however, the test scores are roughly from 11 to 19, and each of the 50 percentiles

in this midrange differs from the next by only about one-fifth of a score. There is quite often more difference between two students in, say, the 5th and 6th percentiles, than between two others in the 55th and 59th. Always remember that percentiles in the midrange represent smaller differences, owing to the crowding of people into the middle of the distribution. When you are comparing two people in this range, you should not assume that they are really different in the quality being tested unless they are at least five percentiles apart.

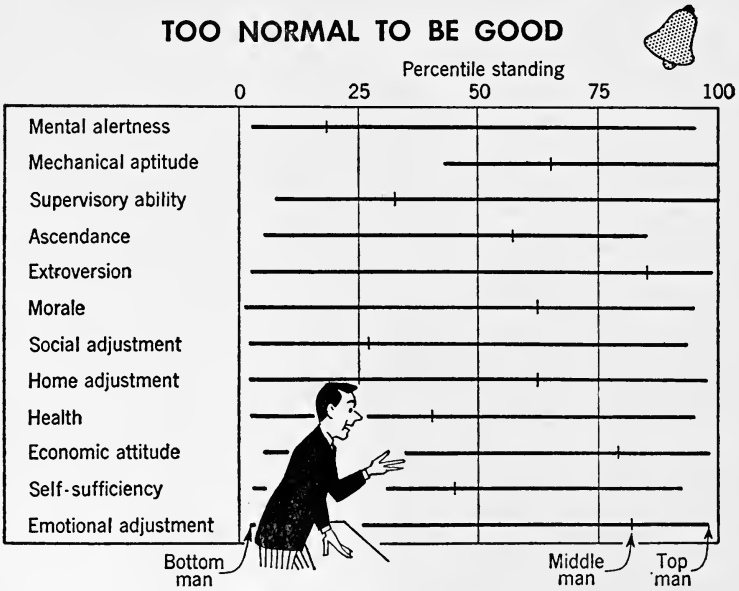
It is obvious that greater care has to be used to size up people in the midrange—the so-called "average persons"—than those at the extremes. There are differences between one average person and another, but it usually takes a second and third look to detect the differences.

Relating ability to the job

The employment department tries to pick people from the percentiles of ability needed for each special job. If the interviewer has enough people from whom to choose, and if he does a good job picking them, employees in specialized departments will not represent a normal distribution. Clerks and accountants, for instance, should come from the high percentile end of the distribution. Some jobs require ability in business mathematics, others do not. Some require high intelligence, others low intelligence. So, for many types of work a normal distribution curve would mean that the employees had been poorly selected for the jobs. Study the chart "Too normal to be good." If *all* the people in a company are considered, however, they will likely fall into a normal distribution.

During labor shortages a lack of applicants may make it impossible to hire only those especially qualified by their individual abilities. Therefore, some employment departments

"take a second look," following up employees' success, and as vacancies occur they encourage an employee to transfer to other work which he may be able to do better, or may like better.



A bird's-eye view of one company's foremen. The length of each line shows the wide differences between the top and bottom man in each quality. Except for mechanical aptitude, they scatter all over the lot. The crossmark on each line shows the median, or middle man; that is where the distribution curve would be highest. This chart reveals that the company has not done a good job of selecting supervisors. With good selection the range of ability would be mostly within a quartile sector of the chart. (Data courtesy Dr. James E. Bathurst, the National Association of Foremen.)

Sizing up, especially in the midranges, should be a continuous process. The first impression must be checked and rechecked by following up the proficiency and satisfaction of the man on the job until he is at last in his right niche.

As Robert R. Morse, Jr., president of Fairbanks, Morse & Company, says, "Companies produce men as well as products. Carefully conducted employment practices and periodic evaluations of employees is good for both the company and the individual." Modern mass production makes use of specialized abilities, and there is a loss to both worker and company unless employees are selected from suitable quartiles.

There is no average person

The average person, or "common man," is a myth, created by statistics and kept alive by politics. One may be average in a dozen qualities, and not average in two hundred others. The possibilities for variation within the individual are almost limitless; there are no duplicates or carbon copies in human nature. Even "identical twins" are far from identical. Lumping people together as "average stenographers," or "average mechanics," ignores the dozens of little differences which may count for a lot in the long run. We are all eccentric to an extent.

Managers sometimes cause needless trouble for themselves by assuming they employ average people. Standard procedures are prescribed for doing given jobs, but the individual often needs to modify the standard procedure so it will fit his anatomy, and his mental and muscular abilities. Unfortunately, workers are not always alert and self-analytical enough to do this, so they often produce at lower levels than they could, and with more fatigue. Part of the supervisor's job is to note these variations and to stimulate each worker to make the best use of his own abilities.

Since the average person is a myth, it is unwise to assume that others are just like ourselves. The man for whom figuring "comes naturally" may think there is something lacking in the speedy typist who is stumped by simple arithmetic. And the

typist, in turn, may think it queer that that fast figurer is a poor speller. After all, such differences are needed in our highly specialized business world. Develop an appreciation of the individual as an individual.

The employer can never "get someone to take Joe's place," for there is not another person just like Joe in the wide world. The popular song in which the swain looks for "someone exactly like you" expresses a hopeless quest. As they say, the mold was thrown away after each of us was cast. That is why the duties or methods of a job often have to be changed a bit when taken over by a new person.

Partners often find it good business for the firm to take out high insurance on their lives, for when one dies there will not be another to take the exact place he filled. Barnum, the circus man, was a flamboyant, impulsive, mediocre near-failure until middle life. Then he teamed up with cautious, penny-watching Bailey, who supplied the abilities Barnum lacked. Gilbert and Sullivan, of light opera fame, fizzled when they broke their partnership and tried to work separately.

The most successful partnerships are commonly between individuals who are very different; the differences supplement each other to make an unbeatable all-around team, while each on his own may have too many shortchanges for success. You should pick a business partner, not because he is like you, but primarily because he has qualities which will help the business and which you lack. To do this requires that you do some self-analysis, frankly facing your own shortchanges in ability. This may be momentarily embarrassing, but it is better than stumbling through life a stranger to yourself.

Successful sizing up of people requires the habit of looking for ways in which they are above or below average. And we also need some sort of a yardstick to show how much above or below they seem to be in the various qualities.

You might as well start the habit now, by considering some business or professional men you know. In which of their characteristics do they seem to you to be above average? In which are they below? What tangible evidence can you give to support your estimates?

Since prejudices are most likely to have sway when sizing up people who belong to different groups than our own, we will look into group differences in abilities in the following chapter.

Chapter five

SEX, RACIAL, AND JOB DIFFERENCES

WHAT'S AHEAD

Comparing groups
Some sex differences
Racial, religious, and national differences
Job analysis and job specifications

Comparing groups

"He's an Irishman, now we'll have some laughs."

"Watch out for Giuseppe. He's an Italian, and you know how hot-tempered they are."

"I'd put Carl on that job. He is Swiss, and you know they're all wonderful mechanics."

"Let's get a French girl for receptionist. The French are always tactful."

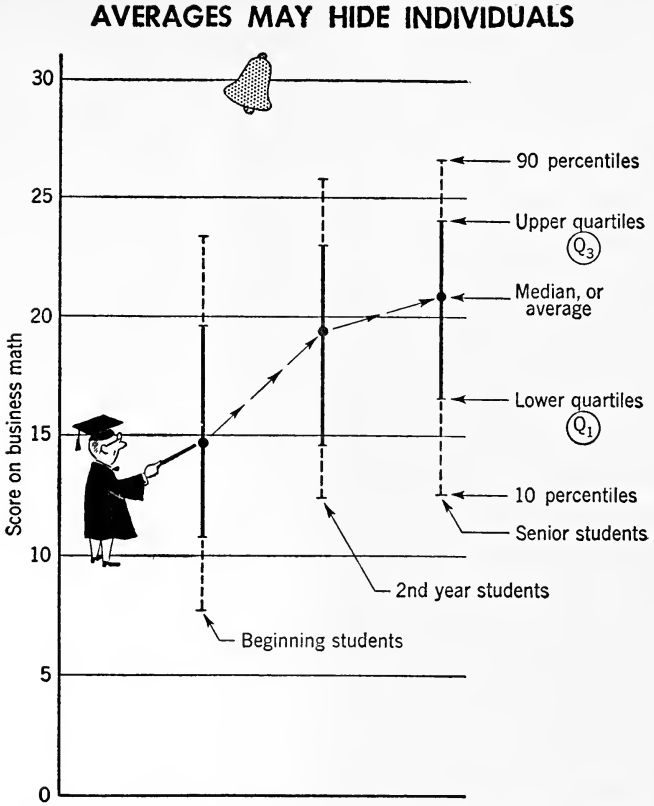
These people are all talking through their hats. Like many amateurs, they are attempting to size up others on the basis of certain ideas they have about group characteristics. Many groups do have distinctive characteristics—but the people belonging to them do not necessarily have the average qualities of their group.

You want to hire a man, for example, for simple accounting work. It would seem natural that a man who had studied accounting for three years would be better than one who had studied it only one year. But look at the chart "Averages may hide individuals." This compares the ability in business mathematics of groups of students who have completed one, two, and three years' study of accounting. The average goes up a little each year, partly because less capable students drop out, but notice that the average for senior students is only a little above the start of the upper quartile (Q_3) for beginning students. This means that almost one-fourth of the beginners are as good as the average senior, and that some senior students are not as capable in business mathematics as the average beginner.

Whenever groups are compared there is always such an *overlapping.* Well-to-do people average higher in intelligence than the underprivileged, but some of the latter have high intelligence and may become the well-to-do and the leaders of tomorrow. People cannot be judged by the average of the groups to which they seem to belong.

The group to which people belong may give us a hunch, but that hunch needs to be verified. We may suspect that a member of a group of day laborers might have an intelligence quotient of about 100. Before feeling certain about that guess, however, we should check how far the person got in school, the grades he received, and other tangible indications of intelligence. While his intelligence quotient is probably around 100, it may be as high as 130, or as low as 70.

Don't lump people together in groups. Always assume that an individual is an exception to the rule, *and size him up as an individual.* There are some well-established group differences that are worth knowing, but bear in mind the likelihood that the individual is an exception in some or many respects.



Group comparisons of ability, showing the overlap which is neglected when only averages are compared. The average for second-year students is much higher than that for beginners, but many beginners have more ability in business mathematics than the average second-year, or even senior, student of accounting. (Data courtesy The American Institute of Accountants.)

Some sex differences

Men and women are different in many ways besides the obvious ones of appearance and voice. A man is stronger, even when his height and weight is the same as a woman's, for women's muscles are a bit more "watery." This is an inborn difference, and is not due to the greater use of muscles on the part of men. However, a few women of the "powerful Katrinka" sort are stronger than many men. It should always be borne in mind that abilities or powers within a group follow the normal distribution curve. The curves for sex differences overlap. Thus, an exceptionally husky private secretary may be able to move a loaded file cabinet to the other side of the office, but usually a man with a hand truck is required.

The female skeleton is different, especially in the joints, which allow for greater swing of movement. It is relatively easy for a woman to fasten a dress that buttons down the back, but a man nearly breaks his arm trying to insert a back collar button. This difference in structure makes the average woman more graceful in dancing, skating, and many other activities. It also makes her throw balls differently, and run with a different stride.

Women excel in the dexterous use of their fingers, and therefore predominate in the manufacture of ready-to-wear clothes and other occupations requiring such skill. Women excel in memory and mental imagery, and in the ability to use words—qualities that help in office work and teaching.

Men excel in ability to use numbers, and in visualizing relationships of objects in space. Their ability to visualize, for example, what the inside of a typewriter looks like, accounts for men's predominance in mechanical work where relationships of machine parts have to be comprehended.

These differences between men and women are apparently inborn. They appear early in childhood, and become greater

with experience. Girl babies, for instance, learn to talk before boys. There are, in addition, some significant differences between men and women in personality and interests, which are probably mostly acquired rather than inborn; they will be taken up in the sections on personality and emotions.

In intelligence there is no difference between men and women in general, though some men, who seek out women of lesser intelligence in order to protect their own self-esteem, imagine otherwise. This notion also has consequences we will learn about later in the book.

Racial, religious, and national differences

There is practically no scientific information about inborn differences between racial or national groups, though there have been many guesses and much prejudice. We can be sure that most of the differences we think we notice in persons of another race are not in inborn abilities or powers but are in language, eating habits, customs, etc., which are often due to different climatic conditions or to religious teachings. Superficial as the differences may be, they nevertheless breed prejudice and intolerance, and may cause trouble in a firm which has evenly balanced numbers of people from different cultures. When the workers of a different race, religion, or nationality do not exceed about 10 per cent of the employees, there is seldom friction. But when the minority group reaches about 20 per cent, the others become apprehensive and may precipitate trouble to "protect their security."

The amateur is especially likely to be misled by his notions about racial and national differences. Strange styles in clothes, unusual customs, or different skin color make foreigners seem very different. He should remember that he seems just as different to them. The Japanese, for instance, said American soldiers looked funny because their eyes did not slant. An American

businessman asked a Korean merchant when the dead would come back to eat the bowl of rice put on the grave. "At the same time the dead American comes out of the grave to smell the flowers," was the answer.

There are greater differences between successful workers in some different occupations than there are between the sexes or between racial groups. Insurance salesmen and cost accountants, for instance, are like two different breeds of creatures in many respects. The professional baseball player and the high school teacher seem to be from different worlds.

Job analysis and job specifications

Special jobs require special abilities, although there are some "all-around" jobs which require an "all-around" person. A special ability, you will recall, is just more of an ability than others may have, not something that is present or absent altogether.

Modern mass production methods have broken down jobs into small units which often require highly specialized abilities. By making jobs smaller, they have paradoxically increased the need for special abilities. The small machine shop or office can use an "all-around worker," but the functionalized mass production system calls for specialized individuals. Mass production robs the worker of some feeling of individuality, yet specialized work demands greater individuality than general work does.

So *job analysis* has developed as an important aspect of modern industry. Job analysis is a study of the operations involved in a job, especially in terms of the abilities and powers needed to perform it well. After a job analysis is made, it is possible to make a *job specification* of the sort of person who is likely to be best for this particular job. Job specification includes physical characteristics, sensory and muscular abilities, mental aptitudes, and sometimes experience.

The United States Employment Service has made job analyses

and specifications for hundreds of occupations. It has set up 45 characteristics which are needed in varying amounts by various jobs. Many of these characteristics are not elementary qualities, but complicated traits, such as tact—an important quality for the receptionist, but less important for the receiving clerk. In later chapters we will study primary mental abilities, but, in the meantime, here is the list originated by the United States Employment Services for sizing up both jobs and people:

Worker Characteristics

1. Work rapidly for long period
2. Strength of hands
3. Strength of arms
4. Strength of back
5. Strength of legs
6. Finger dexterity
7. Hand and arm dexterity
8. Foot and leg dexterity
9. Eye-hand coordination
10. Foot-hand-eye coordination
11. Coordinate independent movements of both hands
12. Estimate size of objects
13. Estimate quantity of objects
14. Perceive form of objects
15. Estimate speed of moving objects
16. Keenness of vision
17. Keenness of hearing
18. Sense of smell
19. Sense of taste
20. Touch discrimination
21. Muscular discrimination
22. Memory for details (things)
23. Memory for ideas
24. Memory for spoken directions
25. Memory for written directions
26. Arithmetic computation
27. Intelligence
28. Adaptability
29. Ability to make decisions
30. Ability to plan
31. Initiative
32. Understanding machinery
33. Attention to many items
34. Oral expression
35. Skill in written expression
36. Tact in dealing with people
37. Memory of names and persons
38. Personal appearance
39. Concentrate amidst distractions
40. Emotional stability
41. Work in hazardous conditions
42. Estimate quality of objects
43. Work in unpleasant conditions
44. Color discrimination
45. Ability to meet and deal with people

Experiment with this list. Size up some job with which you are familiar, and make a plus mark beside each characteristic which you think the job requires to more than average degree. Then, just for fun, go through the list again, and draw a circle around the plus marks for those characteristics in which you estimate you are above average. But don't assume, at this stage, that this indicates your qualifications for that occupation. If you are seriously interested, go to the United States Employment Office and ask an occupational counselor for their job analysis of that occupation, and for an analysis that will show how well you would fit it. Detailed vocational testing and counseling is available also through the Veterans Administration.

Chapter six

PROFILES OF AND CEILINGS ON ABILITIES

WHAT'S AHEAD

How your abilities are put together
Common factors underlying abilities
Profiles of individual abilities
Do machines make individuals less important?
Remodel your ceilings

How your abilities are put together

If the parts of an automobile were assembled as haphazardly as human abilities are, it would fall apart on the first curve. Our abilities are like hash—pretty well mixed up, with some puzzling ingredients. You may be steady as a rock when aiming a rifle, but wobbly when trying to draw a straight line; your steadiness is not consistent. Your desk top may be a model of neatness, but your top bureau drawer a jumble; your neatness is not consistent. You may be honest with widows and orphans, but pleased to cheat the bus company out of a fare; your honesty is not tied together very securely.

Thomas Jefferson was not aware of this hash in human make-

up when he wrote of Alexander Hamilton: "Timid on water, horseback, in sickness, it would be a phenomenon if his courage, of which he has the reputation in military occasions, were genuine." The truth is that Hamilton could have been genuinely brave in battle, and just as genuinely fearful when he had a stomach-ache.

Jefferson's error is repeated by the man who says, "If I catch you in one lie, I'll never believe you in anything." And he probably won't believe you in anything, even though you may be truthful in most things.

Most human abilities and characteristics are highly specific. We do not have one general ability, but hundreds of specific abilities. Sir Francis Galton's work on mental imagery first showed that we don't have one general power of imagery, but several powers. Whistler, the painter, had amazing imagery for pictures "in the mind's eye"; but he could not imagine what the smell of a fresh cup of coffee was like, and could imagine the tinkle of a bell only faintly.

There is no "index number" or score to classify one's all-round abilities, and there are no "types" by which normal individuals can be truly labeled. People with extreme characteristics are sometimes called types—the short or tall, blond or brunette, fast or slow, smart or dense, painstaking or careless—but *type* is a word psychologists like to avoid. Most people are not at either extreme, and those who are at the extreme in one quality may be middlewise on most others. The traits of most people are all mixed up, like the ingredients of that hash. We have to estimate many details and steer clear of a general impression.

Common factors underlying abilities

If we examine restaurant hash closely we can see there is some meat in it, some potato, some bits of carrot, and some

other things of which we may be suspicious. These are *common factors* in the hash. Mathematical psychologists keep their calculating machines hot, analyzing mental tests in their search for similar common factors in human abilities, factors which may produce differences in specific skills. For all their man-hours of search, they have discovered very few; the researches only raise suspicions that there may be an unknown factor, like our suspicions about the other ingredients in the hash.

A study by Dr. Robert H. Seashore, of Northwestern University, made for the Office of Naval Research, may be taken as an example. He used seven different tests of "steadiness" in eye-hand coordination, which is characteristic No. 9 on the list used by the United States Employment Service. He wanted to see if there were a common factor of "steadiness"—important in manufacturing operations as well as in gunfire and aircraft control. All the tests required accuracy, but not much speed or strength. Similar as they seemed to be, the factor analysis revealed that "stationary steadiness is relatively independent of steadiness where movement is involved." Dr. Seashore "suspects" three factors around which eye-hand coordinating abilities cluster: (1) curving movements; (2) accuracy in making a straight movement; (3) general body sway, or stationary steadiness. Dr. Seashore concludes, "A lathe operator and a drill-press operator might not require the same kinds of 'steadiness.'"

A few common factors around which some abilities cluster have been discovered, even though we are mostly bundles of highly specific aptitudes and individual qualities. This relationship between traits is called a *family of abilities,* clustering around a common factor or "parent." Few such families are found when large numbers of people are studied, but an individual may be fairly self-consistent in related activities. As Dr. Seashore points out: "One individual may learn quite a bit about skills having to do with driving an automobile or a motor

boat, while another might be consistent on driving an automobile or flying an airplane." It is necessary to study the individual.

Leadership might be expected to offer a good example of a family of abilities, but it is yet to be shown that there is such a thing as general all-around leadership. A good office boss, for example, may fail dismally when put in charge of a gang of shop mechanics; one minister will succeed with a men's Bible class, while another succeeds with a large group of women and fails with the men. Ulysses S. Grant, as a general, was a great leader; as President he was a mediocre leader, and he failed in business after his term as President. John Quincy Adams, a strong ambassador and Congressman, was not much of a leader as President. They lacked that mythical "all-around" leadership.

Dr. Launor F. Carter, at the University of Rochester, completed experiments (also for the Office of Naval Research) on various kinds of leadership in which those everyday observations were confirmed. He found that a man could be a "natural leader" in intellectual or clerical work, but become a follower in mechanical work, and vice versa. Leadership in mechanical assembly work is apparently a different kind of leadership. This throws light on the fact that some capable shop foremen, though they have plenty of intelligence, cannot be successful as general managers.

Training for a job must follow the specific skills the job calls for. Mock-up or dummy training (using imitation automobiles screwed to the floor to train drivers, for example) gives little practice in the skills needed for traffic. General training helps round out the individual and makes him a better man in the long run, but it gives little direct preparation for a particular job. The job still has to be learned as a job. College graduates learn this the hard way, for 42 per cent fail to make good on their first jobs after graduation.

It is not safe to judge an individual by one, two, or four of his abilities, or to predict success in one undertaking because of success in another. Abilities have to be studied piecemeal, and in every situation. We must have a profile of many of each individual's characteristics in order to size him up usefully.

Profiles of individual abilities

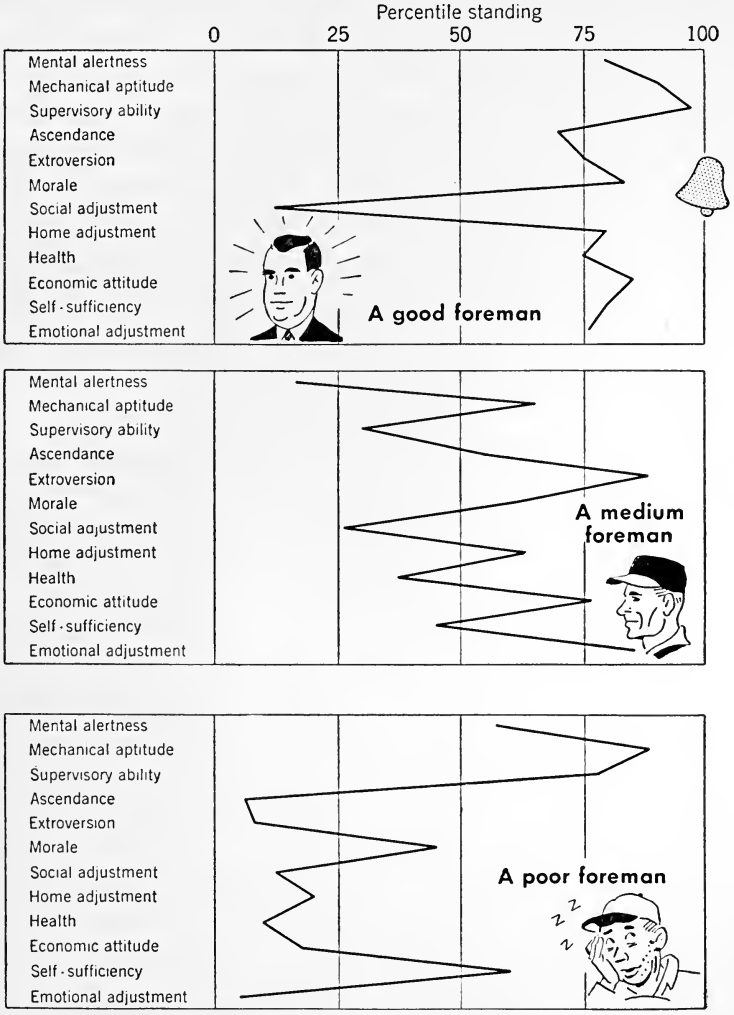
Like a profile portrait, an ability profile gives an outline of the individual's features, showing in this case his ins and outs in characteristics. Sometimes *psychograph* is the term used for it. We have mentioned leadership. Let us look at the profiles of some Wisconsin factory foremen. This chart shows the profiles of one supervisor who was considered good, one considered average, one considered poor. Note that the profile of the good supervisor hovers around the 75 percentile mark in most characteristics, the average supervisor hovers around the 50 percentile, while the poor one hovers around the 25 percentile. Such a clustering around a level is typical for an individual. It gives a slight correlation between most qualities, but not a high correlation.

Note, also, that each of these men has one or two characteristics in which he is much higher or lower than his general level. Those are the strong points or weak points, of which everyone has his own peculiar varieties. These ups and downs lower the correlation between characteristics, but are important to consider in job placement and vocational guidance.

Do machines make individuals less important?

"Machines alone do not give us mass production," says Henry Ford II. "Mass production is achieved by both machines *and* men. And while we have gone a very long way toward perfecting our mechanical operations we have not successfully written into

ABILITY PROFILES OF THREE FACTORY FOREMEN



(Courtesy Dr. James E. Bathurst, the National Association of Foremen.)

our equations whatever complex factor represents Man, the human element."

Individual differences in ability steal from production and profits when an individual's make-up does not match the job specifications. The chart "When 1 plus 1 equals 5" shows how these differences magnify costs when high-speed production machines are used. Machines that do work formerly done by ten people actually make people more important. Automatic machines do not reduce the human element: they increase dependence upon the human element.

For example, the hand worker used to turn out only ten electric bulbs a day, using equipment that cost no more than the trousers he wore. Today, electric bulbs are turned out at the rate of thousands a day, by an automatic machine which costs as much as an airliner and requires a highly skilled engineer in constant attendance. That engineer has much more responsibility than the old hand worker; he can ruin thousands of bulbs in the time in which one man formerly could ruin a single bulb. The engineer can ruin a costly machine, while the hand worker's tool equipment was negligible in cost.

In the old days of hand letterpress an inaccurate worker's errors in price quotations would print only a few copies in an hour. With today's high-speed duplication of letters, an hour's inaccuracies would reach thousands of customers.

High-speed machine production, whether on office machines or factory machines, magnifies human errors or lack of skill. Studies of actual operation reveal that even "foolproof machines" are not as automatic as they seemed on the drawing board.

The Psychological Corporation recently studied the output of nylon hosiery on "almost human machines" which knitted two dozen stockings at a time. The hosiery company complained because some stockings from these machines were lighter than others. This lack of uniformity was first blamed on the nylon

yarn, for the manufacturer assumed his automatic machines would produce uniform hosiery. The psychologists' investigation, however, disclosed that the variations in weight of stockings from these machines "in which the human element was minimized," did actually depend upon the operator. They found some 200 ways in which the operator might influence output. The nylon

Individual differences in the production rates of 21 girls who have been given the same training in loom preparation for rug weaving. The 2 speediest girls turn out the same production as the 5 slowest. (Data courtesy Dr. William McGehee, Fieldcrest Mills.)

yarn manufacturers were absolved, and the hosiery firm began to give more attention to the selection and training of its machine operators.

Similarly, it has been shown that the abilities of the individual soldier become more critical as warfare is mechanized. General Clovis E. Byers, personnel director of the United States Army, told a Congressional committee, "The new tools of war require intellectual giants. Frankly, we are running out of geniuses to use them."

It is always safer to assume that the high-speed machine makes the human element more critical rather than less so. People

are important even in what seems to be a mechanized world. Neglect of the human element causes as much bungling as trying to typewrite while wearing mittens.

Remodel your ceilings

Do individual differences set ceilings above which it is impossible for one to rise? Maybe yes, maybe no—it depends partly upon the person, partly upon his employers and teachers. Almost every person can improve *in the use* of his aptitudes.

Aptitudes themselves, the capacity for acquiring skills, have limits in most cases. There is a ceiling on the number of colors your eyes can distinguish, on the capacity of your ears to hear tones, on the strength and coordination of muscles. But scarcely one person in 10,000 comes anywhere near his ceilings in the use of capacities. The blind do amazing things with their sense of touch, simply because blindness forces them to use other senses with a skill that seeing people neglect to develop.

Ability is aptitude *plus* application. Or it may be aptitude *times* application.

The capacity of the senses is largely inborn, but we can improve their use a little, and make them pay a better dividend, as teatasters do, for example, with the sense of taste. Muscular strength and coordination are also mostly inborn, though they can be improved by training a little more than the senses can. Intelligence is not quite so much inborn as the others. It can be improved most, by the improvement of memory, concentration, and other mental powers.

Industrial job training often trains only the senses and the hands, and neglects to raise the ceiling for mental abilities. William B. Given, Jr., who became president of the American Brake Shoe Company at the age of forty-three, expressed it this way: "How much more is my inherent ability than my effective

ability? No one ever gave his best. It's just as true about you as the man under you, and worth keeping in mind."

Chapter seven

BRAIN POWER AND INTELLIGENCE

WHAT'S AHEAD
Characteristics of intelligent action
A 3-to-1 ratio
Where intelligence is located
How intelligence tests were developed
Various kinds of tests

Characteristics of intelligent action

Charlotte has been on the job four years, packing hosiery in pretty boxes. She is always punctual, never complains, and does not talk much. She is paid on piece rate, and every payday the forelady has to explain how her pay has been calculated, and Charlotte always says, "Oh, is that how!"

Last summer she had a one-week vacation, but came back to work two days early, thinking her vacation was over. Once there was a shortage in the looping department, so she was shifted there as a promotion, but she messed things up and was glad to come back to packing.

One day the forelady sent Charlotte to the office with some reports, but she lost her way back. The forelady thinks Charlotte is such a nice girl, and would like her to have a better job,

or marry. In fact, she arranged a date for Charlotte with one of the machine adjusters at the employees' picnic; he said she was "beautiful but dumb."

The machine adjuster was correct. Charlotte does not have much intelligence, not much capacity for using her head, though she is splendid for packing hosiery.

What should we look for when sizing up employees? According to Dr. George D. Stoddard, the psychologist-president of the University of Illinois, intelligently directed action has these nine characteristics:

Characteristics	An intelligent person	The less intelligent person
1. Does difficult tasks	Can spell rhinoceros	Can spell cat
2. Does complicated tasks	Can find way in big city	Can find way in small city
3. Works with abstract things	Can learn word meanings	Knows simpler words mostly
4. Economy in work	Speedy, accurate	Slow, bungling
5. Adapts to a goal	Works for a purpose	Works for next meal
6. Considers social value	Thinks of other person	Does as pleases
7. Originates	Figures out things	Doesn't figure
8. Concentrates	Keeps on main track	Distractible
9. Resists emotional forces	Controls temper, prejudices, etc.	Spontaneous, impulsive

Those nine characteristics are features of important individual differences in what is variously called:

Abstract intelligence	General intelligence
Adaptability	Intelligence
Brain power	Mental ability
General mental ability	Placement rating

We will call this capacity to use one's head just plain intelligence in this book. Yet it is often wise to be careful about

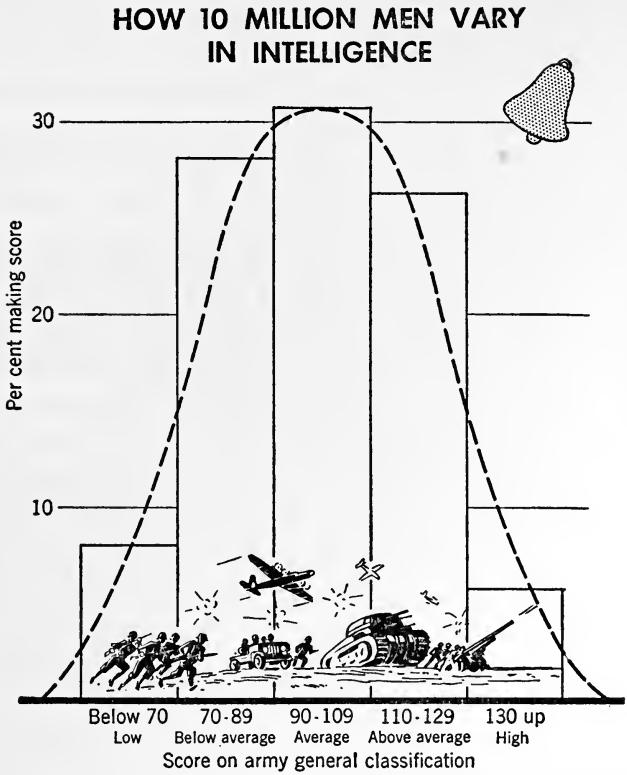
using the word intelligence when dealing with others. People don't mind admitting—sometimes almost proudly—that they are not so good as others in finger dexterity or musical ability, but they are touchy if someone implies that they have low intelligence. It is all right to belittle their fingers or ears, but not their brain power. This touchiness is easily understood since our competitive world puts a high value on intelligence. To call a person dull is as upsetting as to call a man a sissy. And even the person who knows he is bright appreciates being called keen.

To avoid reflection upon this personal vanity, many employment departments speak of an individual's "personal test standing," or they refer to intelligence by the name of test they use. The Army intelligence test, with which some 10 million men were tested during World War II, was strategically called the Army General Classification Test (AGCT). Instead of saying a soldier had low intelligence, he was described as being in Class V on the AGCT. This avoided criticism from those who were ready to charge the Army with discrimination. All people are presumed to be free and equal in a democracy, and so they are politically, but not in size, strength, health, or abilities and powers.

A 3-*to*-1 *ratio*

People differ a little more in intelligence than they do in most other qualities. The differences follow the usual distribution in a bell-shaped curve from low to high, with most of us in the middle, but the ratio between the extremes is about 3 to 1.

The brainiest 100 people in, say, Kokomo, are three times as intelligent as the 100 dumbest. (This leaves out an idiot at the low end, and a possible genius at the upper end.) That ratio of 3 to 1 between the brightest and dullest holds the world over if enough people are considered. It holds in most companies that



Where would you look for officer material? Of those with a score of 130 and up, who took officer training, 90 per cent were commissioned. From those scoring 110–129, 80 per cent won commissions, and from the middle group, scoring 90 to 109, 48 per cent. The bars which show percentages in this chart are known as a *histogram*. The dotted curve shows the normal distribution of the scores.

employ as many as a few hundred people. It would create considerable excitement in Kokomo, or any other city, if some people who were three times taller than others walked down the street. Yet every day people with three times the intelligence pass

each other on the streets and can seldom be told apart by looks. But the differences show up when they go to work. Those at the dull end can do much of the work, but the planning which makes the profits and keeps the firm in business is done by those at the bright end of the distribution.

The chart "How 10 million men vary in intelligence" shows how intelligence is distributed in the general population. The leaders come from the high end.

Where intelligence is located

The nervous system, especially the brain, is probably the "seat" of intelligence. Muscles apparently have nothing to do with it. The ductless glands, especially the thyroid in the neck, may have something to do with it in some cases.

Intelligence is not located in any particular corner of the brain. There are definite brain locations for seeing, hearing, and moving various muscles, but there are no centers yet known for such abilities as judgment, memory, or the understanding of directions. Intelligence is apparently a function of all brain tissue. Surprisingly large amounts of the brain can be removed without seriously affecting the person's brain power. As larger amounts are removed, however, the person loses some of his former ability to *inhibit impulses,* which involves the ninth in the list of nine characteristics of intelligent action.

A modest Pennsylvania housewife, for instance, had almost half her brain removed because of a tumor. After recovering from the operation she could do her housework and the family buying as well as ever, but she began to flirt with the mailman and milkman, and upset the minister by making eyes at him during his sermon. This illustrates one important function of the brain, and of intelligence—the inhibition of unsuitable impulses. The brain is more than a machine to generate bright ideas; ex-

periments prove that its more vital function is as an inhibitor that *regulates* and *steadies.*

Bear in mind that this stuff called intelligence is, after all, *a function,* not a concrete substance. It would be more exact to say that an intelligent person *acts* intelligently, than to say he *has* a lot of intelligence. Intelligence is not a substance in a certain lobe of the brain, but a function of most of the brain cells working together.

One's hat size tells nothing about intelligence, for the size of the head, or brain, is irrelevent. Big brains may be dull, and small brains bright. The quality, the functioning, of the brain makes intelligence.

The blood supply to the brain is apparently important in helping one act intelligently. Dr. Henry H. Donaldson, a world authority on brain anatomy, found that the blood supply is more generous in bright people's brains. This explains why a few drugs which temporarily increase the brain's blood supply also produce temporary increases in intelligence. Let us hasten to add that no medicine has been found that will produce a lasting improvement in the average person's ability to act intelligently.

How intelligence tests were developed

The idea of mental tests was introduced by James McKeen Cattell in 1890, the year after he started the psychological laboratory at the University of Pennsylvania. He was the first to give tests of individual abilities to college students, though they were not what we call intelligence tests. Later, he headed the psychological work at Columbia University and after World War I, when he was sixty, he organized the Psychological Corporation for the professional application of psychology. He was an important leader in the field.

Intelligence tests were started by an ex-lawyer in France. Alfred Binet was a handsome youth who finished law school at twenty-one. Fortunately, few clients came for legal advice, so he sat in his small office with plenty of time on his hands. Not a man to let his mind sit down, Binet used the intervals between clients to think about and study the processes of the human mind, for they interested him more than the processes of law.

He studied some of Galton's experiments on how people differ in sensory abilities and wondered why similar scientific methods could not be used to experiment on how people differ in the higher mental processes. So at twenty-nine he took down his lawyer's shingle and went back to school, to the newly established department of psychology in the Sorbonne at the University of Paris. In a few years he was assistant in the laboratory which he was soon to make world-famous.

When the Paris board of education was perplexed about children who had trouble passing courses, they put the problem up to Dr. Binet. Promptly he went to work experimenting with little tasks and questions which might show a child's ability to follow directions, to reason, understand abstract words, make change, and detect absurdities.

"What is a spoon?" he asked six-year-olds. Most of them said, "It is something to eat with." They defined it in terms of use. But when he asked the average nine-year-old the same question, he was told, "It is usually made of metal, but sometimes wood; one end has a handle and the other end is hollowed out." The nine-year-olds defined common objects in terms that were superior to use.

So he concluded that a definition of a spoon in terms of use was a six-year-old concept, and the nine-year-old who gave such a definition was giving a six-year-old's answer. By 1905 Dr. Binet had standardized enough stunts and questions for *age norms*

through the years of the elementary grades, and they were published as "The Experimental Study of Intelligence." These were the first intelligence tests.

For each age he had standardized a list of questions and tasks which the average child of that age could do. The stunts and questions for each year were a little more difficult, complicated, and abstract than for the preceding year. When a nine-year-old could only do the things the average six-year-old could do, Dr. Binet said the boy's *mental age* was six years. In scientific shorthand this is now written *MA*.

Since intelligence matures from year to year until around the age of eighteen or twenty, the MA increases each year. As a rule it increases faster with a child whose MA is in advance of his birthday age than it does with the child whose MA is less than his birthday age. There is a tendency for the bright individual to become brighter, and for the dull to become a little duller.

Binet's thoroughgoing work started an epidemic of studies of intelligence, studies which influence many aspects of life today. Another European psychologist, Dr. William Stern, was one of the first to take up the work, and in 1912 he invented the *intelligence quotient*, now expressed in scientific shorthand as *IQ*.

The MA indicates the mental age or brightness of a person without regard to his physical age. The IQ shows the relative brightness, *i.e.*, whether one is ahead of or behind his birthday age. Dividing the MA by birthday age gives the IQ. When MA and birthday age are the same, the IQ is 100. A low IQ means dullness, a high IQ means brightness.

The MA of a person under twenty changes every year. The IQ does not change much, but it does change a bit depending upon some things we will learn shortly.

Various kinds of tests

Although started in Europe, the new intelligence tests were embraced with zest by practical Americans, and the United States has been the fountainhead of intelligence testing since 1916. That was the year Dr. Lewis M. Terman, a thirty-nine-year-old psychologist at Stanford University, brought out a revised Binet test, standardized on American school children and young adults.

The early tests of intelligence were primarily for children, and had to be given to only one child at a time. Then American psychologists devised tests for adults, and also *group tests*, which a hundred or more people could take at one time. The first group tests applied on a large scale were the famous Alpha tests of World War I, for use with those who could read and write. In addition, *performance tests* were invented for use with illiterates; in performance tests instructions are given in pantomine, and they require no more writing ability than the making of an "X."

Individual tests have also been developed to greater refinement, and some can be used with babies before they are able to walk or talk. Individual tests are used mostly when the psychologist wants to determine not only the MA, but also the person's method of working and his attitudes.

There is a wide variety of useful and trustworthy tests, but they are sold only to persons who are trained in using them. Tests can now be developed and proved-in for almost every ability. This is such big business—60 million tests a year—that punched card and electronic machines are used to do the scoring for many tests. While the average person will never use tests in sizing up others, he can learn much from discoveries made by the use of tests, such as the ones we will talk over in the next chapter.

But in the meantime, let's sharpen up our habits of sizing up people in general intelligence. Since different levels of intelligence are important in marketing, size up some radio programs and decide whether they are planned to appeal to people who are above average or below average in the characteristics of intelligent action. Compare some magazines and some big city newspapers with the same thought in mind.

It is also good practice to size up some public officials and estimate where they stand—not on political issues, but on the nine characteristics of intelligent action. Forget, if you can, what they vote for, and try to figure out what they have to vote with.

Chapter eight

INTELLIGENCE IN LIFE AND BUSINESS

WHAT'S AHEAD

Intelligence in various occupations
Intelligence range in each occupation
Job promotion and intelligence
Intelligence in instructions and directions
Problems of the lowered national IQ

Intelligence in various occupations

Does intelligence pay dividends in all types of activity? Do people get ahead in the world because they are brainy, or because they are lucky? Are brainy people likely to be impractical? Should we consider intelligence when hiring day laborers?

Intelligence is obviously needed for *schoolwork* and "book learning." There is a definite correlation between the intelligence a pupil has and the grades he receives at school. The correlation is not so perfect as it would be if every student studied with equal diligence, but it is still good enough for a businessman to obtain a fair idea of an applicant's intelligence by checking the grades he received in school.

The amount of schooling a pupil is able to complete is also closely related to intelligence. The first three characteristics

of intelligence on the list at the start of Chapter seven suggest that studies of difficult, complicated, or abstract things would make those of less intelligence drop out or repeat grades. Intelligence sets the limits of one's capacity for education to a large extent. If you have to fill a job that requires real brainwork, pick the fellow who went through the most grades at school; that is a serviceable indication that he is the best candidate for it, even though in some cases he may not actually be.

Ability in *clerical work* is also correlated with intelligence, but not so closely as schoolwork. Clerks with high intelligence turn out more work than those with less intelligence, but only a little more.

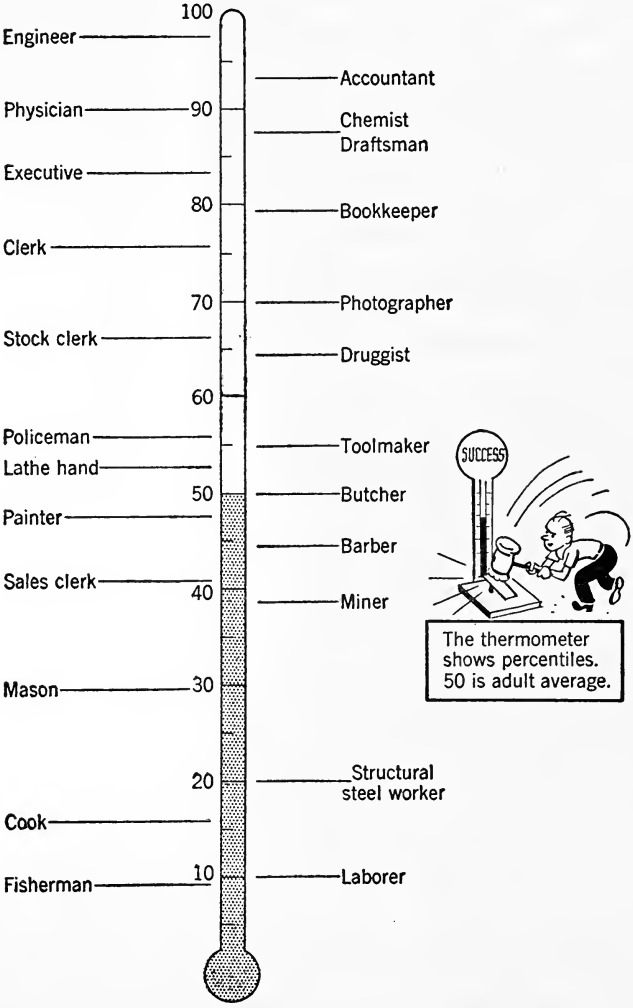
Ability in *handwork* is also correlated with intelligence, but a little less so than clerical work. Routine assembly workers of high intelligence turn out just slightly more than those of low intelligence. (But those of high intelligence will not like the routine work long.)

Assembly workers are sometimes considered mechanical workers, but *true mechanical work,* which an engineer or mechanic does, calls for a high amount of intelligence. The garage mechanic, for instance, needs intelligence in addition to skill with his hands; his intelligence helps him "figure out things."

There is a definite correlation between an individual's *earnings* and his intelligence, although the relationship is lowered by some exceptions, such as an occasional moron who makes money at a job no one else wants.

It is fortunate that people do vary in intelligence by a ratio of 3 to 1, for that variation fits our wide range of specialization in occupations. The chart "Occupational averages in intelligence" shows how people who make good in and stick to a few common occupations differ in their average intelligence. This chart is drawn as a thermometer, but it might better have been in the form of a ladder.

OCCUPATIONAL AVERAGES IN INTELLIGENCE



There is much food for thought in the facts on this chart. It shows why the poorest credit risks are usually small restaurants. A cook saves his earnings and sets up in business with his own little lunchroom. He averages about 16 percentile in intelligence, but to run a business, he needs some executive ability, and that calls for more intelligence than the ambitious cook has. Result: in a few months his savings are gone and a secondhand dealer buys his equipment.

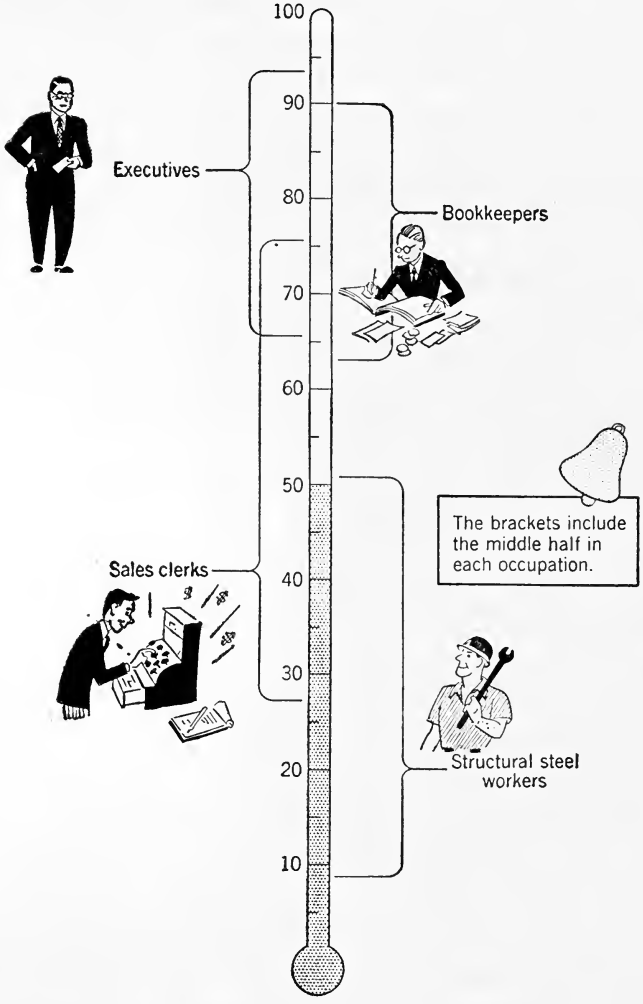
Intelligence range in each occupation

There is considerable range in the intelligence of those in various occupations. This is shown in the chart "Midrange of intelligence in four occupations." The middle 50 per cent of those in each occupation is indicated by the bracket. Compare bookkeepers and executives first; bookkeepers average slightly below executives—but many bookkeepers are more intelligent than many executives.

Consider the range for sales clerks. In the lower quartile are probably those who merely "wait on trade" in small retail stores. Those around the 50 percentile can do some creative selling, handle particular customers, sell the person who is "just looking around," and they may even become section heads in smaller stores. In the upper quartile, where sales clerks overlap executives, are those who will become sales managers, perhaps vice presidents in charge of sales.

The arrow on the brackets marks the average for each occupation. Note that this is near the bottom of the midrange for sales clerks, indicating that the distribution of intelligence among sales clerks is *skewed*, or concentrated toward the lower end. In the case of executives the arrowhead is closer to the upper end. This group is skewed in the direction of higher intelligence—where the senior vice presidents and presidents come from. The

MIDRANGE OF INTELLIGENCE IN FOUR OCCUPATIONS



arrowhead for the average bookkeeper is about in the middle of the midrange, meaning their intelligence is approximately normally distributed. The structural steel workers' average is skewed down.

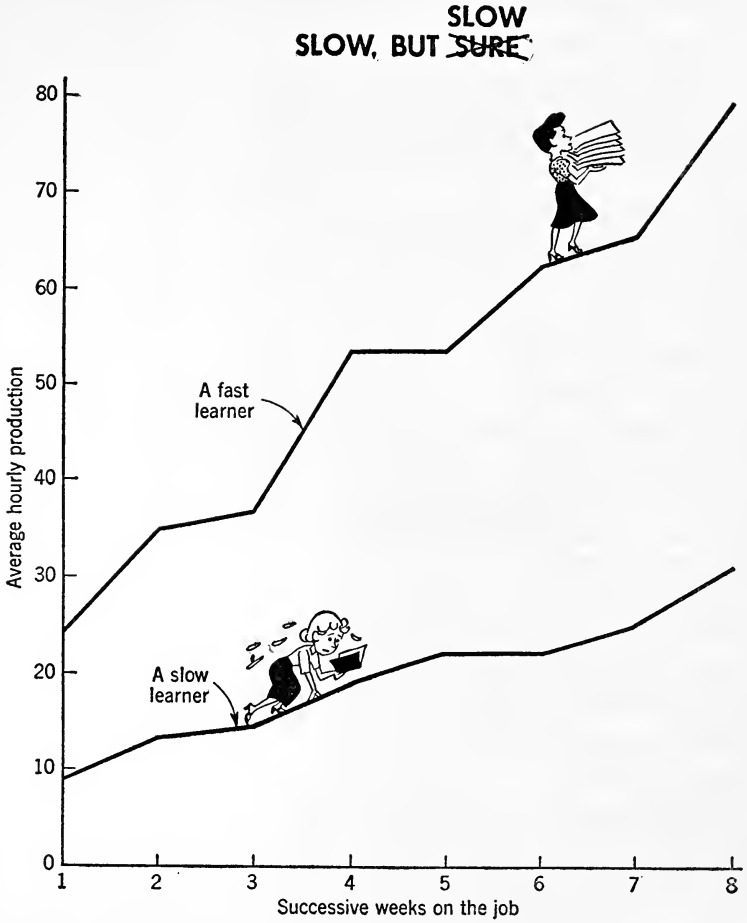
Job promotion and intelligence

Most of us realize from experience that those who are slowest to catch on to a job are below the job average in intelligence. The beginner who learns quickest has either specific aptitude for the particular job or greater intelligence or, probably, both. An inexperienced but intelligent person will often catch on to new work quicker than a duller person who has had similar job experience with a different firm. For that reason, many large sales organizations prefer to hire bright young people without selling experience.

However, the worker of good intelligence who grasps a job quickly must be watched. Unless the work really uses most of his intelligence, he will become bored and quit. Turnover from quitting is high among those who have much more brain power than the work requires, and the quick-to-catch-on workers need to be upgraded before monotony cuts into efficiency. A high turnover rate in departments where repetitive work is done may mean that people with too much intelligence have been placed there.

There is thus an *optimum intelligence level* for most jobs. The midrange, as shown in the chart of the four occupations, probably portrays the optimum for those occupations. Those in the quartile below this level are probably slow to learn and inaccurate, and will have to be nursed along. Those in the top quartile will become restless unless more responsibilities come their way.

Companies which have been static in their personnel for years



Practice often increases differences between people, as with these girls who prepared spools for rug looms. How quickly a person catches on to a job may reveal how well he is qualified for it by natural abilities. (Data courtesy Dr. William McGehee, Fieldcrest Mills.)

are usually loaded with people of optimum or little more than optimum intelligence. The brighter ones have left. This has been found true for some police departments, where the average rookie patrolman is more intelligent than the average sergeant or lieutenant. The policemen who have been in service longest average the least brainy, since the smart patrolmen have resigned to become chiefs of plant guards, private detectives, or to enter other businesses of their own. Many police departments have difficulty finding a lieutenant with enough intelligence to become captain, and may have to go outside the ranks to locate a chief.

When a company can't supply promotions for those with more than the optimum intelligence needed, the intelligent ones get work elsewhere. In that case, when a vacancy does occur higher up, the company seems to be full of deadwood with no one capable of taking the higher position. Some companies have gone under for this reason.

It is good business to have a reserve supply of brains in a company. But those with too much intelligence for their present work need to be hurried along up the line before they are lost.

Intelligence in instructions and directions

You may know what you are saying—but will the other person? A small-town plumber wrote a university chemist to report his discovery—clogged drains could be opened quickly with hydrochloric acid. The professor wrote back: "The efficacy of hydrochloric acid is indisputable, but the chlorine residue is incompatible with metallic permanence."

"I'm glad you agree with me," the plumber acknowledged on a postal card, to which the chemist hurried to reply, "We cannot assume responsibility for the production of toxic and noxious residues with hydrochloric acid and suggest you use an alternate procedure."

That brought another postal from the plumber: "Still glad a learned man agrees with me."

This time the chemist's secretary answered: "Don't use acid. It will eat away the pipes."

General Billy Mitchell, father of the United States Air Forces, found that when his orders were not followed, it was usually because they were not understood. "I always kept an officer at my headquarters to whom I read all the orders," he said. "If he could understand them, anybody could. He was not particularly bright, but was one of my most useful officers for that reason."

The 20 per cent of the population that is either superior, very superior, or gifted, seldom needs directions or instructions; they can see what needs to be done, and better ways of doing it, often before they are told. It is a different story with some 12 million workers at the other end of the scale of intelligence. The otherwise intelligent executive oftentimes displays stupidity when he makes instructions "naturally," without adapting them to people who are slow to comprehend, and who are sunk by big or abstract words.

Many average workers fail to understand job instructions, pensions, pay computation, and safety procedures. These plans and their presentation need to be simplified and made clear as crystal. Employee magazines sometimes accomplish little because they are edited at an executive level, rather than at the worker level; they need to be more like the tabloid newspapers or comic books. The working agreement with a union is sometimes written in legalese it would take three lawyers to understand. Dr. Robert C. Rogers studied one company whose working agreement was only two-thirds comprehensible to the average supervisor after hard study.

"The man who can express his thoughts in common words can be understood by all," said Henry L. Doherty. "The man

who uses unusual words speaks to many who, though having their hearing, might as well be deaf."

The practical moral is:

1. Use simple words, and short sentences.
2. Use demonstrations and gestures when talking, and drawings and cartoons with printed material.
3. Repeat instructions and directions a second time.
4. Have the other person repeat them back to you.
5. Then assume they did not understand, and check early to see if instructions are being followed.

Problems of the lowered national IQ

Every taxpayer has a stake in the intelligence of the whole population. A large part of the tax money goes for relief of paupers and unemployed, and for custodial care of delinquents and petty criminals. These individuals, who drain the public purse, are likely to be people of dull or lower intelligence. People of all degrees of intelligence get into jams and become social problems, but those of low intelligence are more likely to keep in hot water.

One reason these social problems are not decreasing is *differential fecundity.* Parents in the slum section, with IQs of 80 or thereabouts, have five or more children, with IQs of 80 or thereabouts. Suburban parents, with IQs of 120, have one or two children. Big families used to be the rule. Benjamin Franklin was one of sixteen children. Betsy Ross was the eighth of seventeen. But big families have gone out of style.

Most of the seriously feebleminded are sterile, but the less seriously feebleminded are prolific. A young wife who won $12,500 in a "baby derby" contest by having eight babies in ten years, was later found to be feebleminded with a mental age of only eight.

It has been indicated by some surveys that differential fecundity causes a drop in the national average IQ of about one point every ten years. This throws light on the problem of a business that employed more than 100,000, yet could locate only 35 among this horde who wanted to take supervisory training and had enough intelligence to qualify for it. This possible lowering of intelligence from one census period to the next makes the task of sizing up and locating intelligent people increasingly important. With less intelligence available, it is essential to use all the brain power everyone has. It is also necessary to simplify jobs in many industries, and to introduce longer training periods, with skilled training departments. It is a mistake to minimize the importance of differences in intelligence.

Consider the PDQ woolen mills in a small New England community. This thriving little mill was started by grandfather MacIntosh, we will call him, who learned the business in his native Scotland. His son, whom we will call Eustace, kept the mill humming and about 150 employees busy. Eustace had two sons. In his last will and testament he bequeathed little to the older son "because he is able to take care of himself," and gave control of the mill to the younger son "who needs more help." A fair enough distribution of property, it seemed, but the younger son needed more than the mill to help him. He needed about 15 more IQ points, which the older brother had. Twenty years later the mill was out of business, and the little community it supported was poverty-ridden for lack of employment. The older son did all right for himself as executive of a large mill in the South.

Businesses do not run themselves. Brains are needed as well as capital. It takes more than a bequest to provide for those of lesser intelligence. They need training, and a steadying hand such as a trust can provide. It is the poorest form of doing good to give those of low intelligence property to run down or run through.

A related problem arises when a clever mechanic starts a business which grows beyond the capacity of his general intelligence to manage. This is a situation in which the manufacturer makes and loses a few fortunes. Most communities have such a man; he was "in the money" for a few years, but didn't seem to know how to keep the business running after it became more involved than a simple machine shop with a dozen or so employees.

A little honest self-sizing up can prevent this "bad luck" in many instances. Here is one tinkerer, for instance, who devised big gadgets for which there was a big demand. The business grew so rapidly it overtaxed his general intelligence, and he failed. He started again, with a broken shoestring and some new gadgets. As soon as his new venture showed signs of succeeding he employed a firm of management consultants who ran the entire business except for designing new gadgets. For years now, this firm has had more than 5,000 on the payroll.

Another example of the value of self-sizing up is Robert G. When his shop became too prosperous for him to understand all that was going on, he sold out most of his patents, and kept the little shop. "I'm smart in my way," he said, "but not smart enough to run a big shop. I'll make a living from a small shop, and my boy will not be beyond his depth when he takes it over."

Chapter nine

SIZING UP INTELLIGENCE

WHAT'S AHEAD

Hindrances and helps in estimating intelligence
How age affects the IQ
Distribution of the IQ in the population
Should a person know his IQ?

Hindrances and helps in estimating intelligence

Listen to these comments by people who, consciously or unconsciously, are sizing up others:

"Look at this beautiful handwriting! She is bright."

"He's been in the department longest, and must be the most intelligent."

"He has overhanging eyebrows, like Galton's, so must be pretty brainy."

"Ole is the best patternmaker in this district. Must have a lot of intelligence."

"She has bright eyes. She's probably smart enough to be promoted."

"Jake has trouble figuring; takes him forever to add. He's probably too dumb to be put on that other job."

"Look how that baby is dressed! She's a smart girl."

"Never heard a fellow who could talk so well. I think we should hire him for that difficult job."

Not one of these comments has a trustworthy basis for estimating intelligence.

People are constantly taking the measure of others, but guesswork and prejudices often make these estimates highly inaccurate. Guesses at intelligence are often misled by:

1. Talkativeness
2. Good looks
3. Accomplishment in a specialty
4. Know-how due to experience rather than intelligence

We tend to overestimate the intelligence of glib talkers. Don't be taken in by how much or how easily a person talks—consider sphinxlike Einstein. A rapid turnover of small words does not indicate intelligence. However, it pays for the job applicant to talk easily and rapidly, since most interviewers are impressed by that.

The intelligence of good-looking and well-dressed people is usually overrated, while that of the homely person is often underestimated—but consider ugly Socrates. The size and shape of the head, the expression on the face, and the clothes tell nothing at all about brain power. You can't judge a book by its cover. Don't make the blunder some neighborhood busybodies made as they visited new neighbors. The four-year-old daughter met them at the door, and one visitor said, while waiting for her mother to appear, "She's not very p-r-e-t-ty," thinking it safe to spell out the uncomplimentary observation, "No," the little girl said, "but awfully s-m-a-r-t."

People who have unusual accomplishments, especially in music or art, are frequently overestimated in general intelligence. Like the ability to wiggle one's ears, unusual accomplishments are often due to some special capacity which may be only slightly correlated with intelligence.

Employees who have been on a job a long time and know it

from A to Z are also usually overestimated in intelligence by supervisors and managers. Because of the worker's job know-how, and the fact that he "knows his way around" in the organization, he is given credit for more intelligence than he actually possesses. Before promoting the long-service employee to a job requiring the exercise of more brain power, it is wise to reestimate his intelligence with objective tests.

An aside to bachelors: Before you fall for the beautiful girl, get the same information. She can be a good cook without needing much intelligence, but you want more than a cook or parlor beauty.

Here are some steps which may be taken to make your estimates more nearly correct.

1. *Listen to the words the other person uses.* If he expresses himself clearly and is able to use words with abstract meanings, those are signs of intelligence.

2. *Find out about his schooling.* If the person has finished high school, he usually has an IQ of 95. If he graduated from a better high school, you can add five or more points to that guess. If he was in the top quarter of his graduating class, or if he took a foreign language or mathematics all four years, add another five points. On the other hand, if it took him a couple of extra years to graduate, you would be wise to subtract five.

If he left grade school after being in the fifth grade two years, put him down as a possible moron, and keep him off a job where he has to read directions or use his head. Perhaps circumstances forced him to leave school after the fifth grade, but check his story closely. People give very plausible excuses for their dullness in school.

The person who graduated from college probably has an IQ of at least 110, depending, again, upon the standards of the college. If it was a medical college, make the estimate 115, and if an engineering college, 120. If he has a doctor's degree from

graduate study, his IQ is probably at least 120 or, in the sciences, 130.

3. *Find out about his father's occupation.* Various kinds of work demand varying amounts of intelligence, and the work at which a father finally settles down gives a fair indication of the intelligence he has to pass along to his children. His wife, however, may have been duller or brighter, thereby altering the intelligence level in the children. There is no one fully trustworthy guide for guessing intelligence, and family occupational level may be the least trustworthy. Here, however, is a tabulation of the average IQ of children whose fathers' occupations are:

Professional work	116
Semiprofessional and managers	112
Skilled trades, retail business	107
Slightly skilled work	98
Laborers, farmers	96

But bear in mind that the person you are sizing up may not be typical of the run of the mine. That farmer's daughter, for instance, may not be typical and her father may not be the typical farmer.

4. *Find out what he reads.* Tabloids or serious papers? Comic and picture books, or serious books? Easy or difficult?

If you can understand this book without difficulty you probably have an IQ of at least 100. If it is as easy as falling off a log for you to grasp the ideas from this book, you probably have an IQ of at least 120. We pre-tested it on high school seniors who had an IQ of 120, and they found it easy except for parts which have since been simplified.

How age affects the IQ

The IQ varies a little from year to year, but not much until old age sets in. By the age of seventy it may be 10 to 15 points

lower than in the prime of life. Changes in blood circulation through the brain are blamed for much of this loss. Closely held businesses suffer from this decline in IQ when the owners advance in years.

There is usually a temporary rise in IQ at the time of puberty, when young folks become sexually mature. This occurs earlier in girls than in boys, and gives girls more intelligence than boys during their early teen-years. But in another year or so the boys catch up with the girls, and from then on it is neck-and-neck.

Distribution of the IQ in the population

IQs in the general population follow the normal distribution curve—nature's way of making most people average. Here are the diagnostic names for the various levels of IQ, and their distribution among people in the United States:

Number	Diagnostic name	IQ
375,000	Gifted, or genius	140 up
10,125,000	Very superior	120–139
19,500,000	Superior	110–119
45,000,000	High average	100–109
45,000,000	Low average	90–99
19,500,000	Dull	80–89
9,000,000	Borderline	70–79
1,125,000	Morons	50–69
375,000	Imbeciles and idiots	49 down

IQ tests are not so accurate as your household thermometer, but they are more accurate than your guesses about the temperature. An error of 5 points either way should be allowed in interpreting an individual's IQ. When IQ has been estimated, rather than tested, more allowance should be made. Amateurs are usually way off in their estimates, but trained observers can come within 10 points without using tests.

Here are the IQs which have been estimated for some famous people. The estimates were made from information about child-

hood accomplishments, such as the fact that Galton was able to read before he was three.

Estimated IQ	
200	Galton, Goethe, Newton
160	Longfellow, Thomas Jefferson, Benjamin Franklin, Michelangelo
155	Ralph Waldo Emerson
150	Alexander Hamilton, Mozart, Sir Walter Scott
138	Goering (measured by tests)
135	Charles Darwin
70	"Two-gun" Crowley (measured by tests)

Should a person know his IQ?

Most companies that use intelligence tests do not tell the workers their standing. This saves time and arguments with the 4 or 5 million workers tested each year.

Public schools are about evenly divided in their policy of telling or not telling the students or parents. The policy is determined by the school officials' "sense" of public opinion in the community, and by the school psychologists' gumption.

The individual should know where he stands in intelligence, however, for the knowledge is of tremendous help in many ways. Some people overshoot their ability in ambition, others aim too low, since they lack information about their real brain power. The high school student should know his relative standing in intelligence, so he can plan his career sensibly. We need to start sizing ourselves up correctly early in life.

"I don't think I should go to that college," a high school junior told us recently. "You see, my IQ is 109 so I think I should go to this other school which is not so difficult." Wise boy. And a wise school policy to tell him his IQ, for now he will not beat his brains out trying to make the grade at a difficult college.

Young people (and their parents as well) idealize the future, aiming in more than half the instances for careers which require more intelligence than they have. Result: heartbreaks, failures, and feelings of inferiority. This is perhaps more true in the United States than in any other country, because of our rags-to-riches tradition.

Starting in grade school, the child or his parents can be given practical advice based on his intelligence, without being told an exact figure. He can be told he could go to college or professional school after high school, or that he could plan on some high-grade office work, or that he should look forward to factory work. Experienced psychologists when talking to parents, especially about a child with low IQ, often give general advice rather than an exact figure. The advice means more than the figure, anyway.

There is much staggering through life and business because people do not know either the opportunities or limitations their capacities give them. Life is mysterious enough without being in the dark about one's brain power. Being a bit dull is not half as bad as being that way and not knowing it.

TRAINING EXERCISES

1. Fanny is usually slow to catch on to her work as office messenger. She finished two years of high school, and comes from a large family. What else would you want to know before concluding she is too stupid to learn the job? Consider whether the method of job training might be at fault.

2. Think of some homely people you know who are very intelligent. What makes you size them up as intelligent?

3. What information should be included in a letter of recommendation, or on an application blank, to help size up the person's intelligence? Construct an application blank with this information.

Chapter ten

IMPROVING INTELLIGENCE

WHAT'S AHEAD

Climbing the family tree—or sliding down?
Can intelligence be improved?
Motivation and the ceiling on intelligence
The happy moron may make you unhappy

Climbing the family tree—or sliding down?

Why aren't Paul Revere's descendants running the brass company he started? Did the business get too big for them to handle—or did successive generations become too small for the business?

The big business names of yesteryear have a way of disappearing from the scene. Scarcely a handful of the "influential families" of a century ago are still influential today. That is an interesting comment on how brains and abilities are passed along. A grandson of the founder of Smith & Wesson (gun manufacturers) said, after a Swedish immigrant took over running the family business, "Grandfather Daniel Wesson was a whiz, but since he died we haven't had much ability in the family."

Not all the children in the same family have the same intelligence, for their heredity is mixed from the many ancestors on each side of the family. Today's Reveres, for instance, have inherited their intelligence through 60 ancestors since that famous

midnight ride. Things can happen to intelligence as it is passed through so many in-betweens who, in turn, had many ancestors other than the Reveres.

Children of the same family, however, seldom differ more than 15 points in IQ, twins by only half that amount. Intelligence tends to run in a family, though not as consistently as, say, eye color. Thus one aid in estimating an individual's intelligence is to know how intelligently his parents or brothers and sisters act.

Although intelligence runs in a family, just as height does, it does not run uniformly. Sir Francis Galton was the first to discover that children of tall parents were not quite so tall on the average as their parents, while children of short parents averaged a little taller than their parents. This is the *biological law of regression*—the offspring tend to be more like the average of the race than their parents are.

In like fashion, children of especially bright parents tend to be a little less bright than their parents. Parents who have intelligence quotients of 150 have children who average 125, which is high but much lower than the score of their brilliant parents.

There is a contrariwise tendency, though not so strong, for children of dull parents to be a little less dull than their parents. Geniuses may have feebleminded children, but the feebleminded will not have genius children, though their offspring may sometimes come close to being low average in intelligence.

Regression, the tendency of successive generations to come closer to the average of the race in most qualities, keeps the distribution of abilities heaped up in the middle and scarce at the extremes. Regression causes the children of brainy parents to slide down the tree, while the children of dull parents climb a little. Thus the family line usually comes out to near average in several generations.

Many children slide down the family tree because men tend to marry women of less intelligence. The brilliant founder of a business will be less likely to leave children who are capable

of carrying on the firm if their mother has low intelligence. The man who wants to found a dynasty should swallow his masculine pride and marry the smartest woman he can find.

Look at the record of the Adams family, founded by the "unpromising" farm boy John, who became a President of the United States, and whose son was also a President. John picked and won the smartest girl he could find, marrying her against her father's objections. Succeeding generations of Adamses picked women of the highest intelligence for wives. This has been called the most distinguished and most influential family on this continent.

The tendency of their children to approach the average of the race sometimes disappoints brilliant parents. It gives some foundation for the saying that it is three generations from shirtsleeves to shirtsleeves. This same tendency amazes dull parents who have to take back seats because their children are brighter than they. But it also shows why leaders are sometimes found in unexpected places.

Can intelligence be improved?

For the ordinary person, it is estimated that about 80 to 90 per cent of his brain power is inborn. That is part of his heritage, from which he cannot be cut off in the last will and testament. Does that mean that intelligence cannot be improved by the individual? Definitely not. While the "fixed amount" is large, improvement can be made in the remaining 10 or 20 per cent—improvement that can be of tremendous importance to the individual, his family, and the world.

The brain cells do not increase in number after birth. They do mature a bit, but by the age of six one's brain is practically "done"—as complete as it will ever be. From age six onward, improvement depends upon how the brain is used, exercised, and trained.

A gain of a few points in intelligence results when children

attend a really good school. An intellectually stimulating environment will give a gain of a few more points. So will "using one's head." Many companies have expensive training departments to stimulate development in their employees—not just for routine job training, but for general education and intellectual awakening. Job training doesn't help workers climb the family tree, but stirring up their brain cells does.

The room for improvement is sufficient for an individual to pass from the level of brain power required for a bookkeeper to that required for executive work, or for one "born" at the lower executive level to improve to the vice-president level.

It used to be thought that chess and checkers, and the study of Latin or higher mathematics, were good activities for improving brain power. People with high intelligence like such things, but brain power is better developed by the all-around use of one's mental powers. During World War II groups of men who were in the lowest grade of the Army intelligence test (AGCT) were given intensive three-month courses in general schoolwork and the use of their heads. The intelligence of many of these men was raised to the next higher grade after this course.

Motivation and the ceiling on intelligence

The differences which show up between people in daily life are partly due to the use they make of the capacities they have. People with an intense desire to make good, use their powers fully and thereby raise the ceiling on their intelligence. Others drift along, although they have the capacity to do more. It may be the push or motivation that is lacking, not brains.

Elihu Burritt was a blacksmith in New Britain, Connecticut, who developed skill in mathematics by working problems in his head while pumping the bellows at the forge. Latin and Greek were learned the same way, during blank moments at work when

his brain might have been sitting down. Later, he became an internationally famous linguist, an advocate of world peace, and the organizer of the Brussels Peace Congress in 1848.

William E. Gladstone had an easier start in life than "The Learned Blacksmith," but this wealthy merchant's son was in the lower quartile in aptitude for mathematics. He failed his college entrance examination in math. Methodically he worked to improve his power with numbers, took the examinations again, and the future prime minister graduated from Christ Church College with the highest honors. A generation later, when a student in the same college sought to excuse his failure in mathematics by mentioning that Gladstone had failed it, Dean Henry Liddel said to him, "It is easy to imitate Mr. Gladstone in his failure—see that you imitate him also in his success."

Some executives are famous for their "knack of picking good men." This is as much a matter of inspiring and training them as it is of picking the right men. Great teachers, and great business leaders, have the knack of stimulating others to stretch themselves, so they come nearer to using the full measure of their aptitudes. This stimulation requires an evaluation of the person as an individual, to discover (1) what he needs to develop, (2) the motives which will produce the strongest effort on his part.

Very few people are self-winding. Gladstone and "The Learned Blacksmith" were, but many of us are indebted to some teacher or boss who wound us up. Businessmen should see that their supervisors are of the sort that can stimulate.

Dr. Edward R. Knight, headmaster of Oxford Academy, and a specialist in the Socratic method of individualizing education to make the student stretch, reports many instances which show that ability results from aptitude *plus,* or *times,* motivation. Here are some thumbnail psychological sketches which show how it is done:

The story of L. P. This eighteen-year-old "went to pieces"

when he had to work under pressure, or against a time limit. Tests showed an IQ of only 88. His father had died when L. P. was an infant, and the boy had been raised by a houseful of women who pampered and protected him. They never encouraged him to try, and he was "soft." Dr. Knight found the boy had strong inferiority feelings, became nervous when under pressure, and had defective vision which glasses only partially corrected. The boy was started with an easy study load, which was *gradually increased* so that he did not become aware of the pressure. Living with boys and men as pals was different from the world of protective women he had been used to, and slowly brought out more self-assertiveness. He was educated not to fear time limits or pressure, and his IQ began to climb, reaching a high of 114 in two and a half years, when he entered college. He graduated from college with a "B" average grade, and is now an important executive with a large firm.

The story of E. J. This nineteen-year-old had flunked out of college after one semester. He had an IQ of 112, and a charming personality. His general education was weak, since his family had moved many times causing changes of school in mid-term. His study habits were poor. E. J. was humiliated and discouraged by his college failure. His attitude changed, however, as soon as he realized that his ambition of entering his father's profession was possible. He was taught how to study and how to concentrate, and his self-confidence was repaired. He reentered college, finished the courses in business administration, and is now a successful partner in his father's business.

The story of L. M. This fourteen-year-old had failed three out of four subjects in preparatory school. Poor in reading, poor in spelling, poor with figures, he liked to argue and blame his troubles on others. It was found that, with an IQ of 132, his early school work had been so easy that he had become the class comedian, and consequently was poorly prepared in basic

studies. He also resented the way his family compared him with a more successful brother. Dr. Knight went to work to correct the boy's reading difficulties and his trouble with basic mathematics, encouraged him and restored his self-confidence, so that the argumentativeness disappeared. Today L. M. is a successful physician.

The story of V. T. This fifteen-year-old was big for his age, but hated school. He had been passed through the eighth grade "because of his family's prominence." He had been helped through grade school by private tutors who actually did the homework for him without stimulating him to use his head himself. He was a loud dresser, and conceited about his appearance. He had no ambition. Dr. Knight's point of attack was his interest in sports and his desire to pilot his own airplane. The boy's interest in animals and hunting was the springboard to biology and zoology. His desire to travel around the world became a motivation for the study of languages.. He began to want to learn, and a challenge to his manhood aroused the desire to stand on his own feet rather than sponge off the family wealth. He entered engineering college, graduated as an average student, and today is an engineer in his father's plant. His IQ at fifteen was 102; two years later it was 116.

There are ceilings on individual ability, but most of us leave too much vacant room between our aptitudes and the ceilings. *Methods* of work and *motives* for working can take up where capacities leave off. Capacities come mostly from our ancestors. Methods and motives are up to us.

It pays to raise one's ceilings. It also pays to know where the ceiling is, so one doesn't bump against it when it can no longer be raised. As Washington Irving said, "When I cannot get a dinner to suit my taste, then I endeavor to get a taste to suit my dinner."

The happy moron may make you unhappy

Oh, see the happy moron,
He doesn't give a damn.
I'd like to be a moron—
Good grief! Perhaps I am.

They haven't all been counted, but there are undoubtedly more than a million morons in the country. They make good workers for many jobs, but they also make many problems. Charlotte, whom we met in Chapter seven, was a moron, and so was that girl who won $12,500 in the "baby derby."

The moron has an IQ of 50 to 69, a little more than half the IQ of the average person. As adults, their mental age is between seven and twelve years. The fifth grade of school taxes their brain power to the limit.

There have always been morons, but they were not named and separated for study until intelligence tests were first used. The name comes from the Greek word meaning dull, sluggish.

Morons look like other people. Sometimes they are very attractive, but you can't judge by the appearance of the package. Their brains look just like other brains under the microscope, but they don't work so intelligently as other brains. Morons do not have much for minds, but they have enough for many easy operations. The moron will be happy in an easy repetitive job which others would find monotonous. Training and supervising them, however, requires special understanding.

Here are some tests the average moron will fail on:

Make a sentence using the words: boy, ball, river
Name the 12 months of the year
Tell whether Paris is more than 15 miles from New York City
Tell three ways in which coal and wood are alike, and three in which they are different

It seems impossible, yet there are a million Americans who cannot figure out such simple things. But even with such low ceilings on their intelligence they can do the followings kinds of work well:

plain painting
sweeping and cleaning
packing unbreakable articles
work as mechanic's helper
laundry work
broom making
shoe repairing
jig-saw work
work as waitress
power sewing
cooking
farm work

Some baseball and boxing stars, who have become national heroes, were of moron intelligence and died in poverty because they lacked ability to figure and plan ahead.

Morons often acquire considerable "peasant cunning" which enables them to "cover their tracks" and to give the impression that they are more capable than they are. One vice president in charge of personnel (of all people!) employed a moron for housework and did not learn for six months that she could not read or write. Morons often realize they are "slow on the trigger," and eagerly pick up tricks to offset some of this disadvantage. For example, they may learn never to accept the first offer but always to ask for more money, to slip defective work into another's production, or never to say they quit the job because they disliked the boss or wanted to go fishing. They say the work made them nervous or was bad for their health.

It takes considerable intelligence to have a socialized conscience, and the moron requires more training than others in this respect. Most of the training he gets is in the wrong direction unless he is placed in a special institution. Many problems arise from this lack of moral training, as well as from typical personality kinks. Despite the opening verse, not all morons are happy. Some become sullen and vicious, as when their parents reject them in favor of brighter brothers or sisters. Some get

inferiority complexes as a result of their failure to measure up against normal people. Some are led into vicious antisocial habits by bad influences which they have not the intelligence to resist. Those who acquire personality twists or wrong moral training usually end up in trouble, or in a state training school for the mentally defective. These schools, unfortunately, receive only a small percentage of the morons, and for the most part the ones who have become problems.

Typical of the best of these special schools, and one of the newest, is the Southbury Training School, Connecticut. Of the 1,400 pupils there, some 500 are morons who have sufficient intellectual ability to be self-supporting in the right work, once they are properly trained and their personality problems solved. The training does not improve their IQ appreciably, though some gains do take place.

The school's chief psychologist, Dr. Milton Cotzin, has set up a service utilizing five psychologists and three interns in psychology, to guide the development of skills and habits and to stabilize the personalities of these morons. About one-half the morons are straightened out well enough to be placed in jobs, and after a period of supervision by social workers they are able to proceed on their own. Dr. Cotzin also provides courses for schoolteachers, social workers, employment managers, and manufacturers, in how to handle and train the moron.

The story of Olivia shows what can be accomplished in adapting mental defectives to industrial work. Olivia lived with her mother and three other children in a filthy attic furnished with rickety furniture. They were supported entirely by relief and had been a problem of welfare workers for years. Her father had disappeared, after claiming he was not the father of the last three children. The neighbors thought he might have been right in this. They were disturbed because the children ran the streets, noisy and unrestrained.

Olivia was a model pupil in school, as far as conduct was concerned. She was pretty, friendly, and neat. But after six years in school she had reached only the third grade. The school psychologists found her IQ to be 67.

When Olivia was thirteen, she and the other children were taken to the Southbury Training School, where various tests showed her IQ to be between 64 and 68. Yet she seemed worldly-wise beyond her years. She was given grade school studies at Southbury until she was sixteen, by which time she had reached the fourth grade. She could then tell time, count money, and make simple change. She liked to sing, and could paint and draw with some imagination. These latter accomplishments gave the psychologists a clue for her vocational training.

She was transferred from academic schoolwork, where she had reached her limit, to vocational training in power sewing. She spent two years in this department and learned to make all kinds of dresses; she could read patterns and put them together easily. Olivia decided it would be wonderful if she could find a factory job where she could sew all day long.

How would she get along with others in the factory? How would she take orders? How would she adapt herself to the changed environment? As a test, and also as training for this possible change, she was given new work in the school, as waitress at the evening meal. She got along well with the new people in the dining hall, and took criticism without losing her good disposition.

When she was eighteen the school arranged for her to live with an aunt and work in a factory making women's undergarments. Her earnings, on piece rates, came to about $40 a week. Olivia paid her aunt for board and room, bought her own clothes, and put at least $5 in a savings account each week.

Olivia was encouraged to take part in church activities, and she sang in the choir. Several young men in the young people's

society became interested in the pretty little factory girl and took her to movies a few times, but after a few dates the boys lost interest because they began to realize she was not very smart. If some boy with good habits comes along who does not lose interest, Olivia's future will not cause taxpayers much further trouble. He will find her a pretty and dutiful wife who can cook, make her own dresses, and earn $40 a week—and she will not know more than he does. But, for the good of future generations, we hope they have no children.

It is a good general policy to keep a close watch on people who have not finished the eighth grade, until it is proved they are not morons. And remember that many who claim to have finished the eighth grade actually stalled in the fifth or sixth grade but will not admit it.

In the distribution of intelligence, for every moron there is one person of very superior intelligence, with an IQ of 120 or better. The morons need training to engender good habits; the superior and gifted need opportunities to use the priceless intelligence they have. The morons can work for business. The superior can make the business profitable—they are the preferred stocks.

Chapter eleven

SIZING UP THE PRIMARY MENTAL ABILITIES

WHAT'S AHEAD

How many "intelligences" do people have?

General intelligence, as indicated by the IQ, gives an over-all view of a person's more complicated mental abilities. Recent scientific work now makes it possible to size up people with much more detail.

David Buick's rise and subsequent failure illustrates the need to know where people stand in different kinds of ability. He

was a skilled mechanic who designed a good automobile. But he was not a salesman. Neither was he very clever when he had to figure ahead. He lost his automobile business and finished life as a clerk in a Detroit trade school. He was long on what has been called *mechanical intelligence,* very short on *social intelligence,* and a bit shortchanged in *abstract intelligence.* He had been the best plumber in Flint, and was only fair as a clerk in the Detroit school.

Those three "intelligences"—mechanical, social, and abstract—tell a great deal about a person. But they tell it in a superficial way, since they miss the really basic human qualities we now know about. You will find primary mental abilities easier to size up, however, if you are first familiar with the idea behind these three intelligences.

Mechanical intelligence enables one to work with tangible things, to use tools, and to assemble or repair machines. Sewing requires mechanical intelligence; so does oiling a typewriter or installing a new ribbon. The person who designs, builds, or repairs a machine needs a great deal of mechanical intelligence. The person who uses the machines may not need much, as is the case with the average automobile driver.

Social intelligence helps one get along with others. This does not mean familiarity with the etiquette book, but the ability to adapt oneself to other people. Sense of humor, memory for names and faces, common sense in social relations, awareness of another's mood, and the observation of everyday social behavior are aspects of social intelligence. The salesman needs a good supply of it; the executive can use a great deal.

Abstract intelligence provides the comprehension of ideas and abstract conceptions, and helps one cope with new problems. Morons do not have much abstract intelligence, though they may have enough social and mechanical intelligence to earn more than the head bookkeeper in some instances. Einstein's

discoveries have required superior abstract intelligence, but not necessarily as much mechanical intelligence as would be needed to repair the electric wiring in his table lamp.

These three "intelligences" are not closely related to each other. They describe individual differences in capacities that are fairly distinct. The night club hostess must be long on social intelligence, and may be short on the other two. But we must not credit this socially pleasing person with more aptitude in other respects than she may have.

The term *intelligence* is no longer being used for social and mechanical abilities. They are called simply abilities, aptitudes, capacities, or skills. The term intelligence is now generally restricted to the ability to use one's head (*i.e.*, general intelligence or abstract intelligence) and that is the way the word will be used in the remainder of this book.

Factor analysis and the Primary Mental Abilities (PMA)

Just as intellectual, mechanical, and social aptitudes are three different things, it is now known that general intelligence, or abstract intelligence, is at least seven different things.

For years chemists thought water was an element. Then water was found to be made up of hydrogen and oxygen, so chemistry not only had to be revised, but it also began to advance by leaps and bounds. Similarly, abstract intelligence, which was considered a general quality for years, has been broken down into smaller elements, with resulting progress in psychology.

Factor analysis was the method used to "split the atom" of intelligence. Dr. Louis L. Thurstone, a graduate in mechanical engineering who became a mathematical psychologist, did the splitting in the 1930's. Professor Thurstone invented mathematical methods for analyzing correlations in abilities, which enabled him to discover specific elements in an individual's

intelligence. These methods of factor analysis have been among the most important advances made in the knowledge of basic human nature. Later we will see how they have also revolutionized our knowledge of personality.

The *Primary Mental Abilities (PMA)* can be looked upon as elementary mental forces, or powers, from which intelligence is built. Intelligence turns out to be a complex thing, to which many PMA contribute. The first seven PMA to be recognized were:

Perceptual speed	Space ability
Number ability	Memory factor
Word fluency	Reasoning
Word-meaning ability	

There are others, but at present we will give a detailed description of these. Dr. Thurstone, and the Science Research Associates, 228 S. Wabash Ave., Chicago 4, Illinois, have given permission to reproduce some copyrighted test material which will help you understand these PMA better. The test answers are given at the end of the chapter.

1. *Perceptual speed* is the ability to unify sensations into something meaningful. When listening over the telephone in a noisy office, for example, you may hear only snatches of what the other person says, yet you will catch the meaning if your perceptual speed is good. Or, look at these letters:

bus ne s

With good perceptual speed you can recognize the word *business* quickly, despite the missing letters. Try it again:

ps ch l gy

The mental process that makes perceptions speedy is called *closure*. Closure is the term for the tendency to perceive a part as if the whole thing had been sensed. Closure makes the

scattered parts close together and fills in gaps, like the missing *i* and *s* in the word business. As you first looked at some of the charts in this book, perhaps they did not mean much to you, but after studying them a while the bars or curves seemed suddenly to click into place and mean something. That is an example of closure. (Test on next page.)

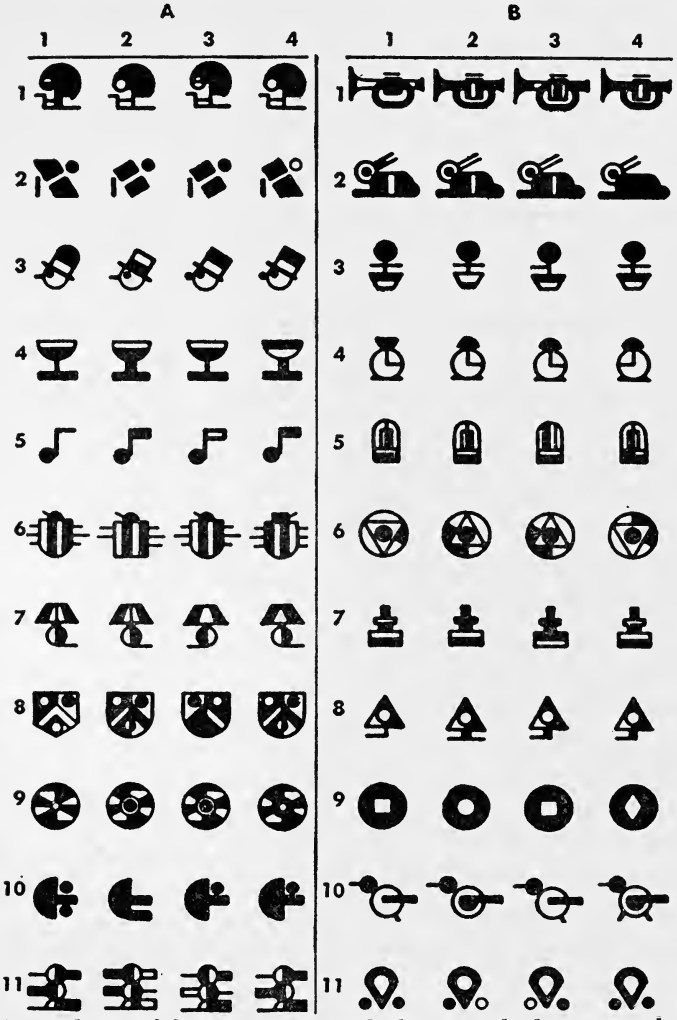
Dr. Thurstone has found that successful administrators test high in closure, which probably enables them to grasp the common meaning in happenings which would seem unrelated to people with less perceptual speed. Good perceptual speed has been found important for some types of inspection work. It tends to produce more rapid readers. It is also, for example, an aid in driving and probably helps the stenographer who takes dictation from a poor dictator. An individual's perceptual speed is fairly well developed by the time he is eight or nine years old.

2. *Number ability* is concerned with simple arithmetic. Higher mathematics and mathematical reasoning are not involved. Einstein is a wizard in higher mathematics, but is said to have trouble figuring change, which involves simple addition or subtraction, or number ability. Cashiers and bookkeepers need good number ability; they do not need higher mathematics. Roy Chapman Andrews, naturalist and explorer, has high intelligence but has trouble with simple arithmetic. Dr. Thurstone finds that number ability matures early in life and he believes that arithmetic could be started earlier in the grades than it now is.

On page 105 is an easy test of number ability. Add the numbers in thirty seconds. If your answers are correct, your number ability may be high. (Answers on page 114.)

Think of some of your acquaintances who have difficulty with simple arithmetic, and who may be presumed to have low number ability. Think of some others who can figure lightning-fast, who enjoy working with figures. Pause after each PMA is described, to think how some of your acquaintances would

SAMPLE TEST FOR PERCEPTUAL SPEED



In each set of four pictures, mark the two which are exactly alike. If you can do this correctly in two minutes, you are probably high in perceptual speed. (Answers on page 114.)

be graded on it—whether upper quartile, lower quartile, or "average." Such practice is essential for understanding and using the PMA. To size up people you should be as familiar with the PMA as you are with the ABCs.

3. *Word fluency* is the ability to think of the right word. As a simple example, think of as many masculine names as you can in two minutes, names like George, Ralph, etc.

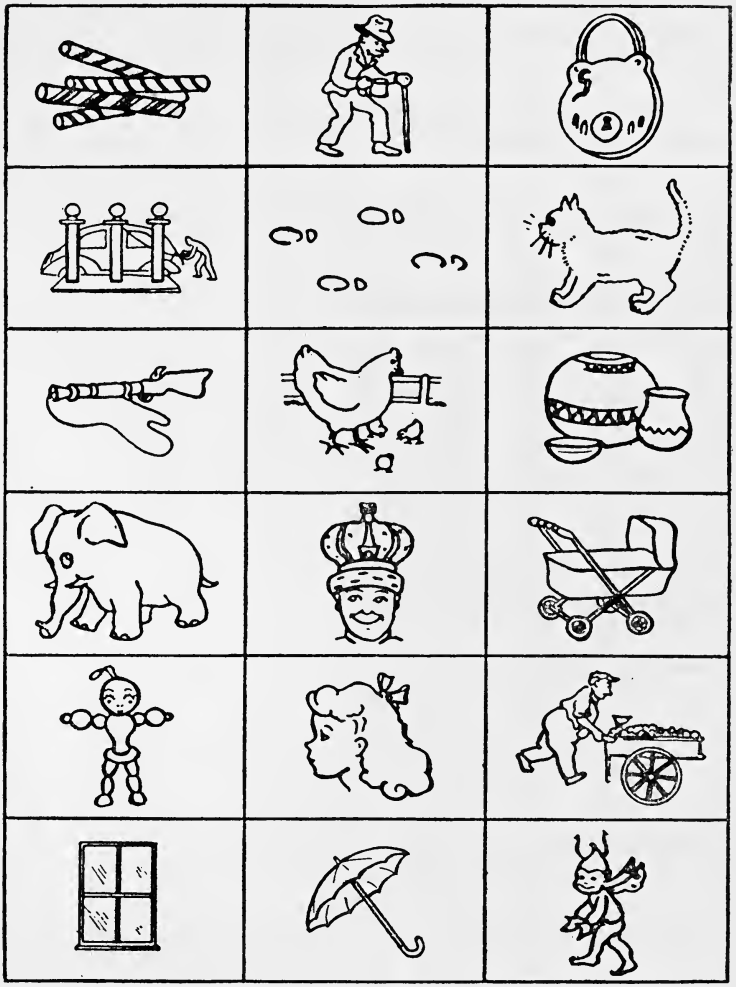
If a stenographer has good word fluency she can often suggest the word for which her boss is groping. Low word fluency is a handicap in public speaking; the speaker who "hems and haws"

68	49	67	84	69	75	56	86
34	38	43	35	56	98	78	35
90	56	86	99	82	78	84	
77	69	46	39	57	74	63	

is either low on word fluency or not at ease in speaking. Even if a person has a large vocabulary, he may still have difficulty bringing up the right word, because word fluency is relatively independent of size of vocabulary. Journalism, personal salesmanship, letter writing, giving instructions, all demand good word fluency. (Sample on next page.)

Dumas, author of French romances, had word fluency to spare, but could not add up a restaurant check. On the other hand, Lewis Carroll, author of *Alice in Wonderland*, was a professor of mathematics who had remarkable word fluency. He invented a language when he was a small boy, and, as a not-too-dignified professor of mathematics, talked about "the different branches of arithmetic . . . distraction, uglification, and derision."

SAMPLE TEST FOR WORD FLUENCY



Give each picture a name which begins with the letter "P." Can you name all the pictures in less than two minutes? (Answers on page 114.)

4. *Word meaning* involves a very different primary ability from word fluency. It is the ability to understand words whether one uses them or not. This PMA is essential in foreign languages, shorthand, history, and science, and it is an important factor in

SAMPLE TEST FOR WORD MEANING ABILITY

1	**Juvenile**	awkward	youthful	dependent	bashful
2	**Famous**	fluvial	renewed	faithful	renowned
3	**Overt**	rich	open	trifling	quiet
4	**Wanton**	gainful	unrestrained	extensive	soft
5	**Remote**	inimical	distended	sparse	far
6	**Potent**	gay	thick	tiresome	strong
7	**Opulent**	wealthy	elective	contrary	hateful
8	**Sere**	withered	cheap	helpful	single
9	**Eccentric**	emphasized	wary	awful	strange
10	**Voluble**	edible	enlarged	dreamy	fluent
11	**Anonymous**	reconditioned	destructive	nameless	synonymous
12	**Acoustic**	melodious	auditory	seldom	ecstatic
13	**Inebriate**	kingly	weary	frisky	drunken
14	**Superb**	gilt	magnificent	immense	minute
15	**Flagrant**	notorious	patriotic	inflated	suitable
16	**Capacious**	hungry	savage	roomy	odorous
17	**Fetid**	amusing	feverish	putrid	contagious
18	**Grotesque**	lively	recumbent	bizarre	tragic
19	**Malignant**	stolid	harmful	worn	poor
20	**Innate**	drunk	inherent	imperative	passive
21	**Prodigal**	lost	beloved	extravagant	young
22	**Frank**	popular	queer	brutal	open

Underline the word in each line which has the same meaning as the first word in that line. (Answers on page 115.)

understanding instructions and in general reading. This factor seems to develop rather late in life. A number of people start to "build a vocabulary" after they have been working a few years and their lack in this respect becomes apparent to them.

5. *Space ability* is the ability to visualize objects in space—for

example, to close your eyes and see how the office would look if the furniture were changed around. Poor space ability makes geometry troublesome, no matter how high an IQ one has. Scientists, draftsmen, clothes designers, interior decorators need space ability in large amounts. William F. Gibbs, famous ship designer, has high space ability, though he is poor in number ability.

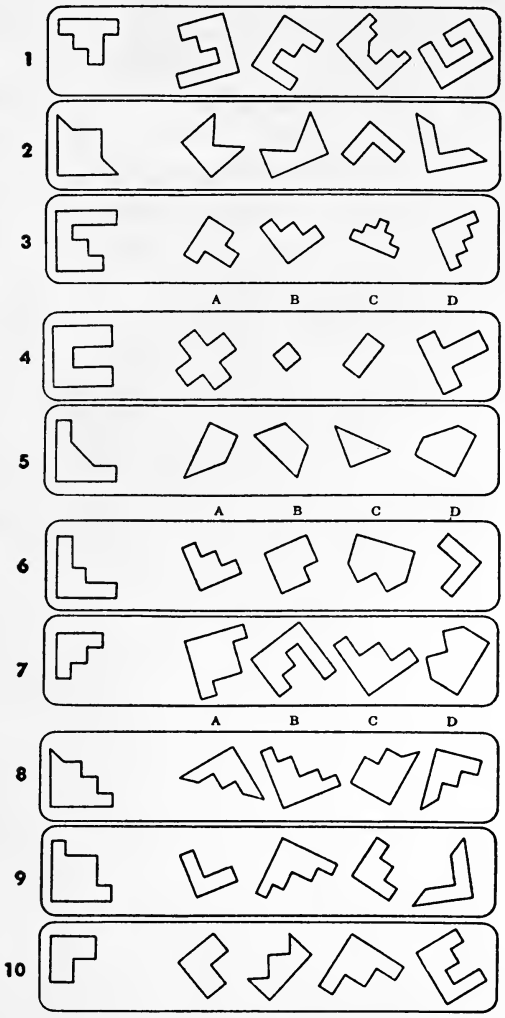
Driving an automobile requires good space ability, especially for backing or parking. So does skilled mechanical work. Dr. Thurstone finds that this ability develops early in life, and he believes geometry could be taught to many grade school children.

6. *Memory factor* is simply the ability to remember, whether intentionally or automatically. It is so low in some morons that they cannot remember their home addresses; in a few people it is so high that they can remember every word on a magazine page they have read once—and without trying to. The memory factor causes telephone companies concern, since there are some 10 million people who cannot remember a telephone number of five digits. In the short time between looking up the number in the telephone directory and putting in the call, the number is likely to be forgotten or remembered incorrectly.

This PMA may be superficially influenced by one's interests. One boy remembers all the baseball scores for last year's world series, but cannot remember the names of the state capitals, in which he has less interest. A businessman may remember what he reads on the financial page, but not what was on the front page. Remembering names and faces, the details of business transactions, appointments, etc., all obviously depend upon the PMA of memory.

As a test of memory, study each of the names on page 110 carefully for about 15 seconds each. Then turn to the bottom of page 112, where the last names only are given, and write the first name that goes with each one.

SAMPLE TEST FOR SPACE ABILITY



In each row, mark the drawing which will make a complete square when it is added to the first drawing in the row. The speed of completing the test measures the ability. Allow only one minute. (Answers on page 115.)

Ralph Condon	Frank Andrews	John Fleming
Mabel Potter	Grace Taylor	Joan Pratt
Betty Edwards	George Adams	Marie Lange
Earl Nash	Laura Jones	Robert Carson

7. *Reasoning* is the ability to plan logically and foresee consequences. It includes the ability to discover a principle or rule, as in a scientist's discovery; or to apply principles to a problem, as when the accountant allocates overhead to various departments. "Figuring things out," which is so difficult for the moron, is "reasoning." Reasoning is needed in algebra and accounting, though only a little number ability is needed for algebra. Executives and engineers need a good supply of this PMA.

Other PMA

Research by Dr. Frederick B. Davis indicates that reasoning ability is in fact made up of four rather separate varieties of reasoning: (1) practical reasoning; (2) deductive reasoning, from general principles; (3) syllogistic reasoning, from a set of premises; (4) reasoning in reading.

And further research by Dr. Calvin W. Taylor indicates that word fluency may in fact be two PMA: *word fluency* and *idea fluency.* Perhaps that amateur public speaker did not "hem and haw" because of low word fluency or nervousness—he may not have had any ideas to talk about. A third possible fluency factor has been tentatively called *versatility;* this would be high with the chatterbox who keeps saying the same thing over and over again, merely using different words for a single idea. Salesmen need this versatility.

There are also at least five PMA memory factors, which you will find discussed in the chapter "Making Memory More Efficient" in our book *Practical Business Psychology.*

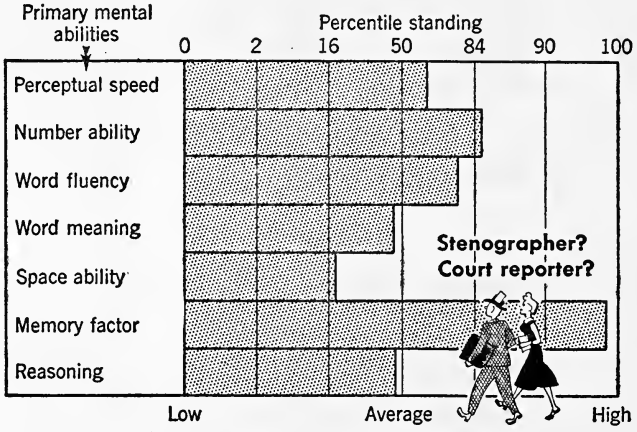
SAMPLE TEST OF REASONING

In each line, find the way in which three of the pictures are alike, and then mark the one which is different from these three. (Answers on page 115.)

Research of this kind is continuing, and many kinds of aptitudes are being explored. Each additional PMA will further improve our ability to size up people. Keep an eye open for announcements of new PMA in your reading of newspapers and science magazines.

PMA profiles and the g-factor

The capacity to act intelligently is organized in a hill-and-dale fashion, for, as we have seen, an individual may be high in one PMA and low in another. The IQ gives the general average of a



(Courtesy Dr. L. L. Thurstone.)

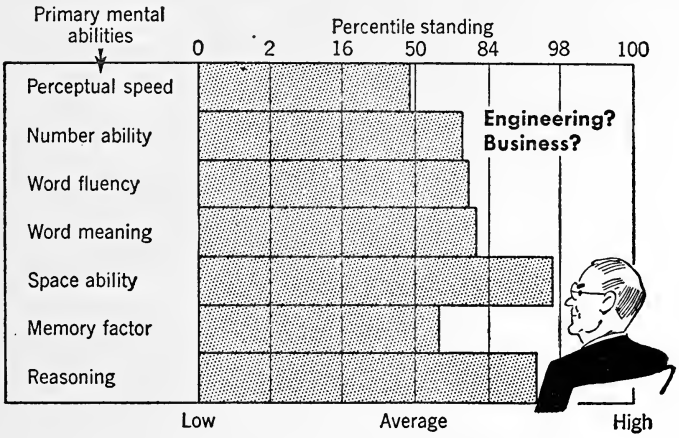
Memory test

Fill in as many of the first names as you can remember

..... Edwards	..... Fleming	..... Jones
..... Lange	..... Pratt	..... Nash
..... Taylor	..... Condon	..... Carson
..... Andrews	..... Potter	..... Adams

person's capacity to use his head, but it does not reveal the high and low spots. Yet when you are sizing up a person, the high and low spots may be the most important things to know. A PMA profile of the individual, showing his ups and downs in various abilities, will give some basic facts to guide the employer's choice of an applicant or the individual's choice of a career.

Two PMA profiles are reproduced for you to size up. One shows the PMA of a young woman who wanted to become a stenographer or court reporter. The other is of a young man interested in engineering or business. Do you think they have made job choices to fit their PMAs? What IQ would you guess that each has? What else would you want to know before ap-



(Courtesy Dr. L. L. Thurstone.)

proving their choices? Obviously, in the case of the young man interested in engineering, you would want to know something about his mechanical intelligence. That will be taken up in the next chapter.

Behind these PMA there seems to be some *general intellective factor.* This *g*-factor, as it is called, may determine whether a person's "hills and dales" are in the upper or lower quartiles.

The PMA of reasoning, space, and word meaning are particularly important in the *g*-factor.

Answers to the sample PMA tests in this chapter

PERCEPTUAL SPEED

	A		B
Row	1—2 and 4	Row	1—2 and 4
Row	2—2 and 3	Row	2—2 and 3
Row	3—3 and 4	Row	3—1 and 4
Row	4—1 and 3	Row	4—2 and 3
Row	5—2 and 4	Row	5—1 and 2
Row	6—1 and 3	Row	6—2 and 3
Row	7—1 and 2	Row	7—1 and 4
Row	8—2 and 4	Row	8—3 and 4
Row	9—2 and 3	Row	9—1 and 3
Row	10—3 and 4	Row	10—1 and 3
Row	11—1 and 4	Row	11—1 and 4

NUMBER ABILITY

102; 87; 110; 119; 125; 173; 134; 121; 167; 125; 132; 138; 139; 152; 147.

WORD FLUENCY

peppermint; pauper; padlock; pumps; prints; pussy; popgun; poultry; pottery; pachyderm; prince; perambulator; plaything; profile; peddler; panes; parasol; pixie.

WORD MEANING

youthful; renowned; open; unrestrained; far; strong; wealthy; withered; strange; fluent; nameless; auditory; drunken; magnificent; notorious; roomy; putrid; bizarre; harmful; inherent; extravagant; open.

SPACE ABILITY

Line	1—B	Line	6—B
	2—D		7—B
	3—B		8—D
	4—C		9—A
	5—D		10—C

REASONING

carrot; bellhop; birthday cake; grapes; boy with hoe; flowers growing in the pot.

IQ—Intelligence

Special sensory abilities
Special muscular abilities

PMA Primary Mental Abilities

Perceptual
Number ability
Word fluency
Word versatility
Word-meaning ability
Space ability
Memory factor
Reasoning
  practical
  deductive
  syllogistic
  in reading
Idea fluency

Chapter twelve

MECHANICAL AND ENGINEERING ABILITIES

WHAT'S AHEAD

Mechanical ability is in the head

A New England mother sent her sixteen-year-old son to a vocational psychologist to determine the type of college course for which he was best suited. She had always admired judges, and hoped her son would show an aptitude for law, but the psychologist reported that his strongest abilities were for engineering.

"What machines did he have you work?" she asked the boy.

"Why, none. He gave me a booklet with many pictures and questions, and I checked the right answers with a black pencil."

"Humph-hh! How can he tell if you could be an engineer, if he didn't let you run some engines, or at least see if you could drive a nail? You just worked with paper and pencil, and that is what a lawyer works with."

The disappointed mother did not realize that such physical performance as using a screw driver is no proof of mechanical aptitude. Skilled hands help in mechanical work, but muscular control is not one of the essential ingredients in engineering aptitude. Ability to work with machinery does not lie in the hands, but in the head.

Henry Ford could watch a machine in operation a few minutes, then recommend a change in some concealed part. He seemed to have an "X-ray eye" for seeing what went on inside machinery. His long, slender fingers were clever with machinery, too, but the cleverness came from the engineering ability in his brain.

Henry Ford had a good head—especially for "seeing right through machines" and for handling practical business affairs—but, like the rest of us, he was shortchanged in some primary mental abilities. His word fluency lagged behind his ability to visualize concealed mechanisms, and dates and movements in history meant little to him.

Primary Engineering Abilities (PEA)

Because engineering skills are essential in mechanized warfare, the Office of Naval Research asked Dr. Louis L. Thurstone to use factor analysis to discover the primary engineering abilities. He found nine basic powers which make up what is commonly known as "mechanical intelligence," "cleverness with machines," "engineering ability," or "mechanical know-how."

We will call these nine basic abilities the *Primary Engineering Abilities* (*PEA*) to distinguish them from the Primary Mental Abilities, or PMA. In sizing up fitness for mechanical work, these nine PEA are the abilities to look for. None of them are located in the fingers.

The tests in this chapter are reproduced from report No. 54 of the Psychometric Laboratory of the University of Chicago, by courtesy of Dr. Thurstone. Try all the tests yourself and study the mental operations brought into work in doing them. This "inside experience" will give you a clearer conception of the various PEA.

Induction

Induction is the ability to discover rules, to reason until one finds what makes things happen. The garage mechanic has to use induction when he figures why the timer points on one make of automobile engine should be set differently from those on another make. Engineers and mechanics need a good supply of this ability. What inductive ability is like is shown by the following test:

In the first series of letters below, the letter *c* should come next, and so this letter has been marked in the answer row at the right. In the second series of letters below, the next letter should be *e*, and so *e* has been marked in the answer row. In the third series, the next letter should be *i*, and so *i* has been marked in the answer row at the right.

c d c d c d	**a b c d e f**
a a b b c c d d	**a b c d e f**
a b x c d x e f x g h x	**h i j k x y**

Now study the series of letters below. In each series decide what the next letter should be and mark that letter in the answer row at the right.

a a a b b b c c c d d	a b c d e f
a x b y a x b y a x b	a b c x y z
a b m c d m e f m g h m	g h i j m n
r s r t r u r v r w r x r	r s t w x y
a b c d a b c e a b c f a b c	a b c f g h

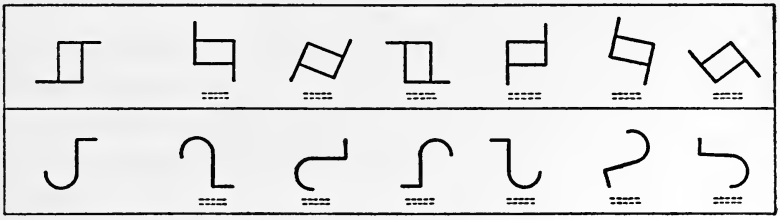
For the five examples above, you should have marked *d*, *y*, *i*, *y*, and *g*, in that order.

Visualizing single-plane space

Visualizing single-plane space is the ability to imagine how a rigid object would look when moved into another position on a flat surface. The housewife visualizes on a single plane when she plans "in her mind's eye" how to rearrange the plates on the table in order to take care of extra guests. So does the handy man when planning how to hang up his tools in the least wall space. The ability to visualize on a single plane also helps the checker player. Here is an exercise which will show you the nature of this PEA.

A sample item is shown below. The task is to decide which figures of the six on the right can be made the same as the figures on the left by sliding the figures around in the plane of the paper. The first and fifth figures on the right are the only ones which can be obtained in this way, so they are marked by blackening the space between the dotted lines under them. None of the other four figures on the right are like the figure at the left. They are made backward.

Below are two more examples to be worked in the same way. Mark every figure which is like the first figure in the row. Do not mark the figures which are made backward.



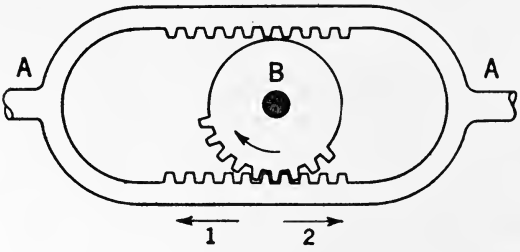
In the first row you should have marked the first, fifth and sixth figures on the right. In the second row you should have marked the third and sixth figures on the right.

Visualizing moving space

This ability helps one "see" how the moving of one part will make other parts move. The amateur seamstress has to turn the sewing machine wheel to learn what will happen, but the engineer can merely look at the machine and see what will happen. The dressmaker needs this ability, so she can see how the parts of a pattern go together. Olivia, a moron with an IQ of around 68, earned more than average piece-rate wages in a corset factory because she was high in this engineering ability and in the one to be described next. How ability to see into mechanical movements can be sized up is shown by the following example:

In this test the task is to answer questions about the mechanical movements that are pictured. In each picture, the part that makes the

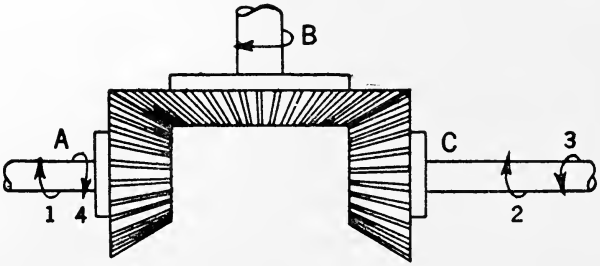
others move is called the *driver*. The solid black circles represent axles which can turn, but cannot move from where they are shown. Now read each question after the picture below. Put a mark under the number of the correct answer. The correct answer to the first question has been marked.



1. If B starts moving in the direction shown, which way will A move? 1 2
2. In which direction will A be moving when B has turned halfway around from where it is now? 1 2

You should have placed a mark under the figure 2 in the second question above.

Here is another set of questions for you to answer about the picture shown below.



A, B, and C are three bevelled gears.

1. If A is turning in direction 1, which way is C turning? 2 3

2. If B is turning in the direction shown, which way is A turning? 1 4
3. If B is turning in the direction shown, which way is C turning? 2 3

You should have placed a mark under 3 in question one, under 1 in question two, and under 3 in question three.

Visualizing reversed space

Henry Ford was high in the ability to turn things around mentally—to imagine what they looked like on the other side without actually seeing the other side. This is somewhat similar to the ability to read a page that is reflected in a mirror. You need a good supply of this PEA when working jigsaw puzzles.

If you have difficulty understanding the differences between single-plane space, moving space, and reversed space, perhaps you are poor in these three abilities. Here are samples of what is meant by visualizing reversed space:

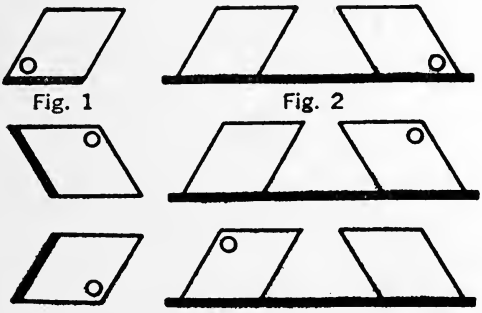
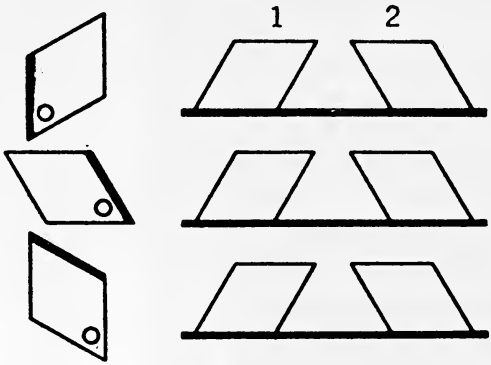


Figure 1 represents a lozenge-shaped card. It has a hole in one corner. It is painted black on one edge. Imagine that it is picked up, turned over, and placed *face down* so that the black edge touches the long black line in figure 2. Decide which of the two diagrams it would fit. Where would the hole be? It is shown in figure 2.

In each of the other two sample problems imagine that the card is picked up, turned over, and placed *face down* so that the black edge touches the long black line. Decide which of the two diagrams it would fit and where the hole would be. In each of these examples a small circle has been drawn to show where the hole would be.

For each of the accompanying problems decide which of the two diagrams the card would fit when it has been turned over, and draw a small circle to show where the hole would be.



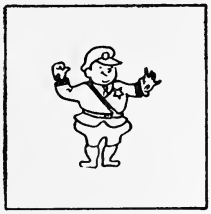
You should have drawn a small circle in the lower left corner of card 1 in the first example, in the lower right corner of card 2 in the second example, and in the upper right corner of card 1 in the third example.

Memory for details

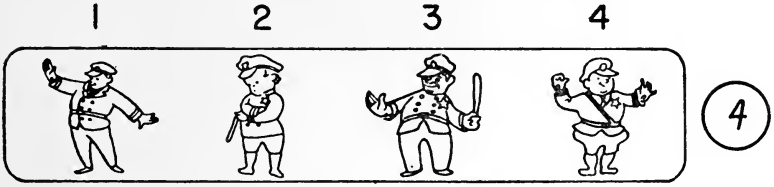
This is the PEA that helps the mechanic recognize a part after seeing it in a parts catalog the day before. Samuel Slater had so much of this ability that he was able to look at foreign textile machines and then build them later from memory to start the American textile industry. The machinist or repairman with a good supply of this PEA should notice imperfections readily. It should also help the cashier spot counterfeit money and forged

signatures. Here is an example of how this memory for details can be sized up:

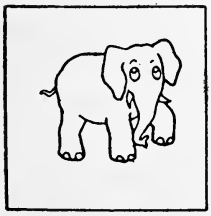
In this test a series of pictures is projected one at a time on a screen. Each picture is shown for a short time only. This is a sample picture.



Below is a sample row of the answer booklet. The number 4 has been written in the circle at the right of the row to show that the fourth picture is the same as the sample picture above.

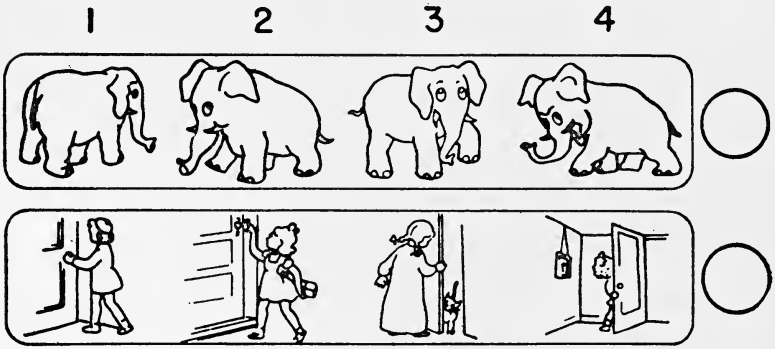


There is one row in the answer booklet for each stimulus picture presented on the screen. One and only one picture in each row of the answer booklet is exactly like one of the stimulus pictures presented.



These two pictures are taken from the series of 84 projected stimulus pictures. All 84 pictures are shown before any subject opens his answer booklet.

Below are the two rows of the answer booklet which correspond to these two stimulus pictures. Indicate which picture in each row is like one of the stimulus pictures by writing the number of that picture in the circle at the right of the row.



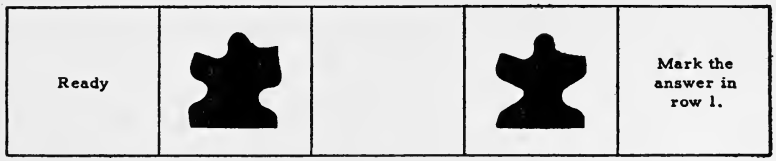
In the two examples above, the number 3 should have been written in the circle for the first row, and the number 1 in the answer circle for the second row.

Quick memory for fine details

Quick memory for fine details enables the mechanic to say, "That bolt is not the same length as the one we just took out." This seems similar to memory for details, but is different in that this "quickie" memory is for objects more recently perceived, and for finer details. The typist uses it as she gives a brief glance at the address she has just typed to make certain the street number is correct.

Henry Ford was high in these two memories, fair in memory for names and faces, low in memory for historical dates. People have several memories, not one general ability to remember. The nature of quick memory for small details is shown by the test on the following page.

In this test sets of five frames like the following set are flashed on a screen consecutively, one frame at a time. The following set is set number 1 in the test. The first frame in the set is a warning signal.



1. S (D)

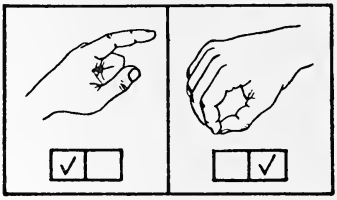
The second frame shows an irregularly shaped figure. The third frame is blank. The fourth frame shows another irregularly shaped figure. In some of the sets the fourth frame is exactly like the second, while in other sets the fourth frame is different from the second. The task is to decide, after the fourth frame in each set has been shown, whether the two figures that have been shown are the same or different, and to indicate the answer by circling on an answer sheet the letter S or D, respectively, in the row indicated by the fifth frame. Row 1 of the answer sheet is shown below the set. The letter D in row 1 has been circled to indicate that the two figures of set 1 are different.

Muscular imagery

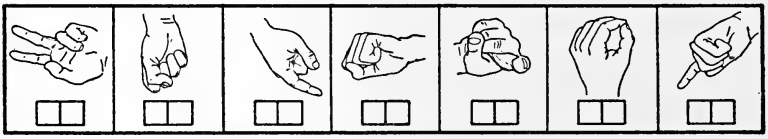
Muscular imagery is the only PEA which has any relation to the popular idea that mechanical ability is located in the fingers, but this muscular imagery is in the head, not in the muscles. It is shown by the ability to imagine the appearance of one's hands in various unusual positions. This PEA gives the mechanic the "feel" for loosening a nut that is in an awkward location. It helps the welder manage his torch in tight places. When I tinker with my own automobile I become convinced that the designers either lacked this muscular imagery or didn't care how difficult they made it for repairmen. On second thought, I

realize that my muscular imagery may not be up to an engineering level. Here is a demonstration of this muscular imagery—see if you can solve these examples without having to twist your hands around or look at them.

In this test you will be shown a series of pictures of hands. Some of these pictures represent right hands, others represent left hands. Below each picture you will find two small squares. If the picture represents a right hand put a check mark in the right square; if it represents a left hand put a check mark in the left square. The following samples have been correctly marked.



Go right ahead and mark the following samples in the same way.



You should have checked the squares for each picture as follows: left, right, right, left, right, left, and left.

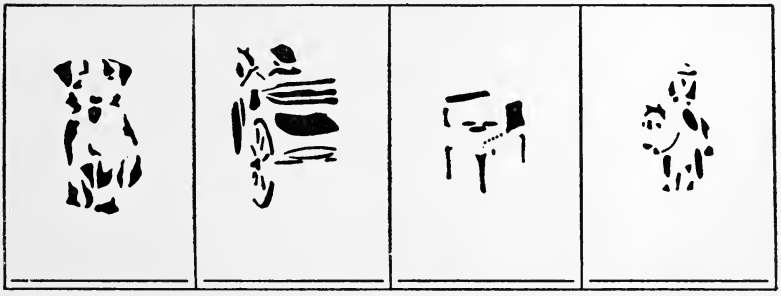
Perceptual speed

In the preceding chapter we mentioned this as a PMA. It also belongs under the PEA. Closure is important among engineering abilities because it helps one grasp the meaning of a group of sensations quickly. It tells whether that sudden bang was made by a slamming door, a falling window, or a chair knocked over by a burglar. It helps one understand a completely new situation.

It is needed by the repairman who is given a basketful of parts and asked to put together some machine he has never seen before. Presumably it helps in catching on to a new job of almost any sort. Here is a test which shows closure in operation:

Look at the figure below. It is a picture of a sailboat, so the word *sailboat* has been written under it.

Identify the following pictures by writing their names under them.



Perceptual flexibility

This seems similar to perceptual speed, but flexibility emphasizes one's ability to keep the essential parts in mind despite distractions. An example is the ability to see what is wrong with

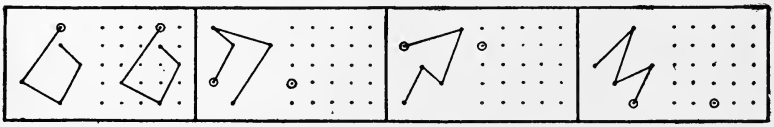
the inking mechanism on a duplicating machine and ignore the parts not involved. Another is to watch the timing gears on an automobile without being distracted by the adjacent action of the camshaft. The electrician who can look at a blueprint and see the electrical lines but ignore the plumbing is using perceptual flexibility.

This PEA is presumably important when working with complicated designs and machines that have subassemblies of moving parts. It also helps the archaeologist to deduce the nature of an entire animal by studying a few bones. The detective uses it in reconstructing a crime from a few bits of evidence.

In the following sample of perceptual flexibility the distracting influence is the background of dots, most of which have nothing to do with the design to be copied. The person who does not keep the main design in mind will be slow.

In this test you are to copy each of the figures in the dotted space to the right of it, starting with the circled dot. There is a dot for every corner. In the examples below, the first one has been worked out for you. Go right ahead and copy each of the other figures in the space to the right of it.

Each copied figure should have the same size, shape and position as the figure from which it was copied.



Sizing up the Primary Abilities

There are engineering graduates who fail as practical engineers because they are too low in some of the PEA. They may have acquired the theoretical information because of a high IQ and PMA, but lack the PEA for putting it to use. Experience and book knowledge count, but they cannot take the

place of the Primary Engineering Abilities. Many self-taught mechanics have become top-flight engineers because they had the PEA needed.

The primary abilities disclosed by modern research are very different from everyday notions about the "units of the mind," and there are no ready-made terms in the language to describe them. A good way to understand the PMA and PEA is (1) to get the feel of the mental processes involved by trying the demonstration tests, and (2) to analyze everyday working situations as to the primary abilities involved in the work. There is a limitation in trying to get the feel for oneself. One may be low in, say, visualizing reversed space, and be slow to catch on to what it is—one may perhaps even doubt if there is such an ability. But, after all, one does not have to die in order to become a funeral director.

Many parents presume that their sons have a mechanical bent because the boys can identify an automobile at sight by year and model. Of course, that accomplishment tells nothing about a boy's PEA. An interest in making things is also misleading; it may mean only that the boy enjoys muscular activity, and his real abilities may be for athletics rather than for engineering. Before he is sent to engineering school, he should be tested for his PEA. Similarly, you will size up a potential mechanic better by looking for signs of his PEA than by asking if he is handy with tools.

Progressive summary of BASIC QUALITIES to size up

IQ Intelligence

Special sensory abilities
Special muscular abilities

PMA Primary Mental Abilities

Perceptual speed
Number ability
Word fluency
Word versatility
Word-meaning ability
Space ability
Memory factor
Reasoning
  practical
  deductive
  syllogistic
  in reading
Idea fluency

PEA Primary Engineering Abilities

Reasoning abilities
Visualizing single-plane space
Visualizing moving space
Visualizing reversed space
Memory for details
Quick memory for fine details
Muscular imagery
Perceptual speed
Perceptual flexibility

Chapter thirteen

FIRST STEPS IN SIZING UP PERSONALITY

WHAT'S AHEAD

Personality patterns
Stereotypes of personality
Components of personality
Emotions
Interest groupings
Primary Temperamental Qualities (PTQ)

Personality patterns

"He's a good enough workman, but doesn't seem to fit into the shop." The Primary Mental Abilities and Primary Engineering Abilities tell whether a person has the ability to do a job, but they do not tell whether he will want to do it or whether he will be able to get along with others on the job. The personality characteristics of an individual may offset real skills for the job.

Nikola Tesla, who made alternating electrical current possible, was a greater electrical wizard than Edison. But impetuous, tense Tesla had some qualities in his personality which kept him from making the most of his abilities. He first worked with Westinghouse, but quit in a huff because of his suspicious, touchy make-up. Then he worked for Thomas A. Edison awhile, but the same

touchy streak made him leave Menlo Park to work on his own. He couldn't get along with others, couldn't share credit, couldn't take suggestions—and his inventive productivity rapidly tapered off.

Edison, in contrast, was genial and easygoing, cooperative and cordial. His many inventions were made in cooperation with a group. He could keep associates so steamed up that they became an insomnia squad, going without sleep to get results. Edison's personality made him a good coordinator and stimulator. But he lacked some personality qualities needed for success in business. None of his companies were very profitable and none of them grew large.

Eldridge R. Johnson was not the inventor that Edison was. Johnson, a bicycle mechanic in a Philadelphia suburb, made a spring motor to run a phonograph shortly after Edison tried to market his. Johnson pyramided his spring motor into the mammoth Victor Talking Machine Co. He was better than Edison in sizing up what the public wanted, and was a superior salesman. Edison considered the phonograph his greatest invention, but bicycle-mechanic Johnson organized one company to produce canned music and made a fortune ten times larger than the great inventor's.

Different occupations require different personality qualities. These qualities often fall into what are called personality patterns. Although no two people are exactly alike in personality, there are many who have similar personality patterns. They may be unlike each other in a hundred ways, but alike in the dozen or two ways essential for a certain activity.

Many businesses have a personality which is revealed by the kind of employees they have chosen and kept. When looking for a job, you will find it useful to size up the sort of person each company favors. Small companies, especially, tend to have a certain type of employee because the manager favors that

pattern. One company will lean toward conservative people, another toward the ultrafashionable. One firm will want all employees to be regular attendants at Sunday School, while another prefers a poker-playing variety. You will be happiest—and considered most successful by your associates—if you work with people whose pattern is similar to yours. Like likes like.

Stereotypes of personality

Stereotypes are false types, the product of false thinking. The dark-haired man with the big black mustache and shifty eyes is the villian stereotype. Note that we have typed him as a villain on the basis of appearance alone—and that is not the correct way to size up personality types.

I was walking through a hotel lobby with a sales manager. He was portly, ruddy-faced, gray-haired, and dignified.

"Look, mamma," a four-year-old girl said as she pointed to him, "there's a doctor." Her mother was embarrassed, but my companion was visibly flattered.

The sales manager obviously resembled the child's own doctor, and his appearance, therefore, coincided with her idea of what a physician should look like. Unreasonable as it may seem, adults are constantly doing the same thing. The sales manager himself had his own stereotype, or false picture, of the sort of man who would make the best distributor for his products. He favored graying men of dignified appearance, and would not hire peppy, enthusiastic young men. Quite naturally, he favored men who resembled himself—though when he had been a successful distributor he was younger, peppier, and less dignified.

Most of us have preconceived ideas about types of people which influence our judgment of others, often to the point of prejudice. The average college student may, for instance, think the typical Turk is cruel, very religious, treacherous, sensual,

and ignorant. He may think the average Irishman is pugnacious, quick-witted, hot-tempered, honest, and very religious. But real-life Turks and Irishmen, or doctors, villains, and judges, do not match these stereotypes. Similarly, individual appearance is a part of personality—but a small part.

Components of personality

Personality is not a separate part of the human mind. It is not something that radiates from some people but not from others. Everyone has personality, the feebleminded person as well as the genius. Personality is individuality—the combination of characteristics which makes every person act and feel a little different from anyone else in the world.

Some parts of this individuality may overshadow other parts. A man's chronic grumbling may offset his skill for striking trial balances; or a man's natural ability to sell may come to nothing because he works only by fits and starts.

Personality results from various combinations of every conceivable human quality. It includes attitudes toward life and responsibility, such characteristics as rapid or slow movements, intelligence and primary abilities, and even such simple things as height, weight, and age. Personality is the individual as an individual, from A to Z.

In practical business life the parts of personality which loom important are related to (*a*) ability to get along with people, and (*b*) good habits of work.

The important parts of the total personality, which seem to cement a person's traits together and determine his pattern of life, are emotions and moods, interests and temperamental qualities. The emotions and moods are probably the core, determining interests and temperamental qualities.

Emotions

Emotions such as fear, joy, anger, disgust, love, hatred, are often temporary, like the fear one has in a near-accident. But people always experience some emotion, even though it may be mild; they are contented or discontented, a little sad or a little happy, irritated or satisfied. Some emotions are permanent characteristics of the person. Hetty Green, for instance, was the richest woman of her time, yet her personality was so warped by hatred and suspicion that she was dreaded by everyone. It was fortunate that she was born rich, for she would have had trouble holding any job.

Intense emotions, such as fear when we just miss an automobile accident, affect the state of the body; digestion is upset, the face becomes pale, we tremble. Emotions are so fundamental in human nature that they can completely upset intelligent control. James J. Hill, president of the Great Northern Railroad, became so excited during a fire in his office that he threw his desk out of a second floor window and carefully carried the waste basket downstairs to safety. Intense emotions are fairly easy to size up by watching other people. Milder emotions, however, are more difficult to read from appearance.

Interest groupings

"Tell me what you like, and I'll tell you what you are," is a famous saying of John Ruskin's. The salesman sizes up his prospect's interests and hobbies in advance, or directs the first conversation so he can learn something about them.

These personal likings may be very simple—like the preference for coffee without sugar, which the clever host will note and remember—but some are tremendously important. Tesla was interested in working alone, and on machines. Edison was interested

in working with others, and on machines. Johnson was interested in working with people rather than machines.

There are many interests which reveal the personality make-up that is suited to one line of work but not to another. As far back as 1927, Dr. Edward K. Strong found that successful life-insurance salesmen have different interests from those of physicians or advertising men. The real-estate salesman and the house-to-house salesman even have different interests from those of the life-insurance salesman. These interests reflect personality qualities which are needed to fit the individual into an occupation. Those who do the kind of work that matches their interests best are likely to be happier as well as more successful.

Here are a few interests which have been found typical of successful people in certain occupations. This is a brief sample from a more complete listing starting at page 124 in our book *The Technique of Personal Analysis.** In each group of five questions, the answer is generally "yes" by individuals of the occupation named.

Accountant

Do you like to read fiction stories?
Do you like to work at puzzles?
Do you like to bargain with others?
Do you like to read textbooks?
Do you like to talk people into doing things?

Businessman

Do you like to play with children?
Do you like gardening?
Do you like a busy day?
Do you like to strike bargains?
Do you enjoy reading business news?

* *The Technique of Personal Analysis* published by McGraw-Hill Book Company, Inc., New York, 1945.

Physician

Do you like to lead a quiet life?
Do you like to play with children?
Do you like to read textbooks?
Would you like to study most of your life?
Would you like to sacrifice your fun for your success?

Salesman, general

Do you like to read fiction?
Do you like to make people laugh?
Do you like to live in a city?
Do you like to persuade people?
Would you like work requiring traveling?

Machinist

Do you like to look after details?
Do you like to handle firearms?
Do you like to play solitaire?
Would you like to develop an invention?
Do you like to plan new ways to do work?

Stenographer

Do you like to work on puzzles?
Do you like to deal with city people?
Do you like to wear stylish clothes?
Do you like to make artistic things?
Do you like to introduce people to each other?

Personnel work

Do you like to dance?
Do you like to read poetry?
Do you like to do church work?
Do you like to read business news?
Do you like to be in style?

Dr. Thurstone has found that such interests can, like the primary abilities, be separated into groups, but these "families of

occupational interests" are not so basic as the PMA and PEA. They are:

1. **Commercial interest,** which is strong in: advertiser, auto salesman, banker, building contractor, business manager, C. P. A., club secretary, factory manager, florist, landscape gardener, manufacturer, office manager, printer, private secretary, stockbroker, tax expert.

2. **Legal interest,** which is found in: banker, clergyman, congressman, corporation lawyer, criminal lawyer, diplomatic service, economist, foreign correspondent, historian, judge, public speaker, stockbroker.

3. **Athletic interest,** prominent in: army officer, athletic director, explorer, forest ranger, newspaper reporter, press agent, professional athlete, radio announcer, rancher, secret-service man, ship officer.

4. **Academic interest,** which is strong in: college teacher, economist, high school teacher, historian, librarian, mathematician, philosopher, psychologist, sociologist.

5. **Interest in people and things,** a general factor found in: actor, advertiser, art critic, artist, explorer, foreign correspondent, journalist, musician, novelist, orchestra leader, press agent, psychologist, radio announcer, reporter, secret-service man.

6. **Biological interest,** which is shown by: biologist, botanist, chemist, dentist, geologist, pharmacist, scientist, surgeon.

7. **Physical science interest,** which shows up strongly in: architect, astronomer, building contractor, chemist, engineer, inventor, manufacturer, mathematician, philosopher, physicist, scientist.

8. **Art interest,** needed by: advertiser, artist, dress designer, interior decorator, musician, sculptor.

In sizing up people, note in which of those eight groups their strongest interests are located. The interests will be shown in what they read, their hobbies and amusements, and conversation topics in which they show most enthusiasm. If their interests match their jobs, they will be "all wound up and ready to go";

if they don't match, they will probably have to be pushed along even if their primary abilities are good.

Primary Temperamental Qualities (PTQ)

Temperament reflects the more permanent moods and ways of looking at life and work which are characteristic of a person. To the casual observer there seems to be an infinite variety of temperaments, but most of the variations are due to different degrees of a small number of Primary Temperamental Qualities. We will find the task of sizing up temperament much easier and more accurate when we know these qualities.

Dr. J. P. Guilford, of the University of Southern California, has used factor analysis to segregate the PTQ. Each quality varies from a low to a high extreme—most people, of course, fall in the middle between the extremes. Here is the list of PTQ, with the extremes described:

Social introversion

Liking to be with people	Seclusiveness

Thinking extraversion

Reflective	Impulsive

Depression

Worry, pessimism	Cheerfulness, optimism

Cycloid

Steady mood	Changeable mood

Rhathymia

Carefree	Serious

General activity

Strong activity	Sluggishness

Ascendance	
Submissive	Forward and bold
Masculinity	
Masculine dominance	Feminine helpfulness
Inferiority	
Lack of self-confidence	Too much confidence
Nervousness	
Composed	Nervous
Objectivity	
Touchy, self-centered	Considerate of others
Agreeableness	
Hostile attitudes	Pleasant attitudes
Cooperativeness	
Tolerant, understanding	Critical, faultfinding

If we attempted to estimate the relative positions of Tesla and Edison on this list, from what we know of their personalities, we would probably conclude that Tesla was more seclusive and impulsive than Edison; less optimistic, steady, and carefree; more strongly active and bold; more dominant rather than helpful, with too much self-confidence; more nervous, self-centered, hostile, and critical.

A person at about the middle in all the PTQ would be called "a colorless personality." While most people are average in most of the PTQ, they usually display or lean toward one or two extremes. These are the characteristics which make an individual distinctive—and which may make him a "pain in the neck." On which PTQ would you estimate that you are near one extreme or the other?

	DOES HE LEAN THIS WAY	1	2	3	4	OR Average	5	6	7	8	9	10	DOES HE LEAN THIS WAY?
A.	Apt to take it easy. Seems to lack physical zip and pep.	←										→	Likes vigorous physical activity. Full of zip and pep.
B.	Inclined to make fast decisions. Acts on spur of the moment. May leap before he looks.	←										→	Tends to be slow on decisions. Considers all sides. Overly cautious and serious-minded.
C.	Inclined to take the lead in any group. Over-anxious to boss others.	←										→	Likes to stay in the background in groups. Inclined to let others take the lead.
D.	Reserved and quiet, usually prefers to be alone, or to work by himself. Tends to be shy.	←										→	Extremely sociable and friendly. Likes to have people around him constantly. Does not hold back with others.
E.	Inclined to be moody - easily discouraged - excitable or "up and down".	←										→	Optimistic and cheerful outlook. Calm, unruffled disposition.
F.	Tends to be touchy. Has to be handled carefully. Apt to take things personally and to resent criticism.	←										→	Faces facts. Is not touchy and can take criticism. Hard to "get his goat". Likes "call a spade a spade" attitude.
G.	Agrees with others too easily. Gives in to them. Not apt to stand up for his own ideas.	←										→	Does not agree with others readily enough. Apt to insist on own way, and to argue for own point of view. Inclined to be bossy.
H.	Critical minded. Sees faults and defects in people and things. Apt to be hard to please.	←										→	Not at all critical. Takes people and things as they come. Seems to be easily satisfied.
I.	Poised, self-confident, not easily irritated or annoyed.	←										→	Tends to worry and to have doubts about himself. Tends to be irritable and jumpy.
J.	Tough-minded toward others. Not considerate and sympathetic. Tends toward hard-boiled side.	←										→	Extremely considerate and sympathetic toward others, tends to be tender-hearted.
K.	Grasps new ideas quickly. Learns fast. Sees into things easily.	←										→	Slower on grasping new ideas. Gets ideas but takes longer to do so.

Scale to help size up Primary Temperamental Qualities. (Courtesy Personnel Dept., The Kroger Co.)

The PTQ are easy to size up after some acquaintance with a person, and with experience, you can make fairly accurate estimates of people from a study of their previous lives, without seeing them personally at all. The more practice you get, the

better you will become in judging temperament in others. Always check up later, if possible, to find out whether your estimate was right or not.

"Remember that first judgments are not infallible and only after you have had sufficient experience should you rely on your estimates," advises Reeves Wetherill of Gimbel Brothers. "In sizing up people it is recommended that you get another's opinion."

Progressive summary of BASIC QUALITIES to size up

IQ Intelligence

Special sensory abilities
Special muscular abilities

PMA Primary Mental Abilities

Perceptual speed
Number ability
Word fluency
Word versatility
Word-meaning ability
Space ability
Memory factor
Reasoning
  practical
  deductive
  syllogistic
  in reading
Idea fluency

PEA Primary Engineering Abilities

Reasoning abilities
Visualizing single-plane space
Visualizing moving space
Visualizing reversed space
Memory for details
Quick memory for fine details
Muscular imagery
Perceptual speed
Perceptual flexibility

Interest groupings

Commercial
Legal
Athletic
Academic
People and things
Biological
Physical science
Art

PTQ Primary Temperamental Qualities

Social introversion
Thinking extraversion
Depression
Cycloid
Rhathymia
General activity
Ascendance
Masculinity
Inferiority
Nervousness
Objectivity
Agreeableness
Cooperativeness

Chapter fourteen

GLANDS AND PERSONALITY

WHAT'S AHEAD

How much of personality is inherited?
The thyroid gland
Adrenals: the emergency glands
Pancreas: the insulin gland
Gonads: the sex glands
Pituitary: the boss of the glands
Glands and personality changes
The "let down" of middle life

How much of personality is inherited?

Intelligence, and the PMA and PEA, are largely inborn, though not entirely, but not much of personality is inborn. Sometimes hot temper, or mistrust of others, or kindliness may "run in a family." In those instances which have been studied, however, personality qualities have almost always been picked up by imitation. Children tend to form an image of the roles they want to play in life from the wish to be like their parents, and a wish may be as powerful as heredity. But most of our traits we have picked up for ourselves.

"I've always been that way" does not prove one was born that way. The attitude or mood may have been picked up before one was old enough to remember. And even though some ancestor

can usually be found to "explain" a characteristic, to blame one's personality traits on one of them, is stretching credulity. "He has his great-grandfather's social introversion" is not heredity, just poppycock.

People do not change much in intelligence, PMA and PEA, which are largely inborn. Once these abilities are sized up, provided they are correctly sized up, there will not be much future change unless the individual is exceptional. In personality, however, more change can be expected. Interests shift as one becomes older. The PTQ will change as one's attitude toward oneself and others is brought under strain. A boss of Tesla's sort causes personality strain which may alter the PTQ of his subordinates.

As a result, the sizing up of personality should be continuous. After a year on the job, the new worker may be a changed man in many ways. That is why many firms have all employees rated on personality qualities twice a year. We must always be on the watch for shifts in personality.

A possible reason for some of these changes in personality is the altered activity of ductless glands. This was the case with Josephine.

The thyroid gland

Josephine had been a successful department store buyer for a dozen years. Always a serious career woman, she had been growing more and more worried. If an article did not sell as well as she expected the first day, she feared she had made a blunder in buying and lost sleep over it.

She had never felt that way before. A slow-selling article had always been a challenge to her to devise some way to move the merchandise. But now a change had crept over her personality. Worry dominated, destroying much of her usefulness to the store.

The store nurse noted a change in Josephine's appearance, and

passed her observation along to the company doctor. Josephine's eyes were becoming prominent—popeyed—which often means that something is out of order with the thyroid gland. The nurse knew nothing about Josephine's increasing anxiety, but she did know that popping eyes meant something. Tests quickly showed that the buyer's personality change was due to a change in her thyroid, and it was corrected.

The thyroid, astride the windpipe, is one of the half dozen ductless glands which play a puzzling part in personality. The ductless glands are also called *endocrine glands* or the glands of internal secretion. They pour their secretions (called *hormones*) right into the blood stream, where they are carried to all tissues in a few minutes.

The swelling of the front of the neck in goiter, which you have probably seen, is due to an enlargement of the thyroid. Josephine had an internal goiter which causes no visible swelling, but does cause bulging eyeballs and unreasoning anxiety.

The hormone made by the thyroid is *thyroxin,* which stimulates the activities of virtually every cell in the body. When the thyroid is active, bodily metabolism is raised. When the gland is sluggish, body chemistry slows down. Josephine could eat three big meals a day without getting fat because of her overactive thyroid. But people who have sluggish thyroids put on weight, since they do not have enough thyroxin to keep metabolism at an average level, and their food becomes fat instead of energy.

On the personality side, a sluggish thyroid can make people listless and inactive; they act and feel all tired out. An especially active thyroid can make people peppy, active, irritable, even worried in some cases. But listlessness and irritability should not be blamed too hastily on the thyroid. Only a small percentage of listless people are affected by lack of thyroxin.

If a once-energetic worker becomes lazy, the boss should get some information about his thyroid and adrenals. But perhaps the laziness is caused by resentment of the boss, or by

anemia, or by some other obscure physical or emotional condition. A simple basal metabolism test will tell whether the personality is due to the thyroid. If it is, doses of thyroid extracts will correct it in many instances.

The thyroid needs iodine. When there is not enough iodine in the diet, this gland may act up. Some regions (the Great Lakes region, for example) have many thyroid disturbances because the natural foods are low in iodine. Iodized table salt, required by law in some states, helps correct the iodine shortage, and so does eating deep-sea fish.

Adrenals: the emergency glands

The adrenal glands, perched on top of the kidneys, release energy for emergencies. Their hormone *adrenalin* makes muscles tense and blood pressure jump. This pair of glands causes powerful bodily changes under extreme emotions, such as fear or anger. It has not been shown that people who are fearful or easily angered are that way because of their adrenals, but such people keep their adrenals overly active and may get blood pressure disorders as a result.

Masculinity or femininity in appearance is partly due to the adrenals. One office girl who was self-conscious about her excessive hair was sent by the personnel office to an endocrinologist (a medical specialist in glands), who prescribed adrenal extracts. Mannish women may be mannish and some men effeminate because of their adrenals. However, these PTQ may also be due to purely emotional factors, which will be taken up in the chapter on sex differences in emotions.

Pancreas: the insulin gland

The pancreas, located just beneath the stomach, has endocrine tissue scattered through it like islands. These islands make the

hormone *insulin,* which is used to treat some forms of diabetes. When the pancreas is in good health, it apparently produces no effects on personality. An oversupply of insulin, however, makes people feel fatigued, jumpy, anxious. Many diabetics are complaining and indecisive, have an attitude of unsettled hopelessness, and are poor mixers. These temperamental qualities often appear before the disease has developed sufficiently to show up in medical tests.

Gonads: the sex glands

The gonads also manufacture hormones which the blood carries throughout the body, but this hormone production goes through cycles. Along with the adrenals, the gonads produce external features of masculinity and feminity. When the gonads first become active in the early teens, a new interest is shown in the opposite sex.

The female hormones control menstruation, and seem to cause personality shifts in some women during this cycle. During pregnancy there is a great change in the gonadal hormones, often accompanied by moodiness and other personality shifts. Many changes in woman's personality during pregnancy, however, are due to their attitudes.

Lack of interest in the opposite sex, or overinterest, is sometimes due to gonadal activity. But "boy-craziness" or "girl-craziness" is more often due to psychological than to glandular causes. When a young girl rushes into a hasty marriage because she is unhappy with her parents, or when a boy chases after women to convince himself he is attractive or to show off, the glands are probably not to blame. Sex causes plenty of trouble in business, but it is usually ideas rather than glands that cause the trouble. An individual's attitudes toward sex, however, should be carefully but subtly sized up.

Pituitary: the boss of the glands

The ductless glands are interrelated, like interlocking boards of directors. The thyroid and adrenals sometimes act in opposition to each other, or they may give each other a boost under some conditions. But the master mind of the endocrines is the pea-sized pituitary, which is deeply concealed in the middle of the skull just beneath the brain. This is the overlord in the front office who inhibits or stimulates the others. The activity of the gonads is especially influenced by the pituitary.

The thyroid can affect weight, but so can the pituitary. Thyroid overweight is distributed over the body, though the ankles may gain more than their fair share. Pituitary fatness is usually in thick rolls or rings, like spare tires, around the waist, and around arms and legs. People with pituitary fatness usually have small ankles.

The pituitary also influences the growth of the bones. Abraham Lincoln was a nice-looking young boy, but in his early teens, when gonadal development started, his pituitary began to act up, causing his unusual stature, big hands and feet, and somewhat disproportioned skeleton. He was fortunate that it stopped there, for circus giants are caused by such overactivity. Midgets and dwarfs, in contrast, have an underactive pituitary.

In normal conditions a slightly active pituitary is sometimes found in muscular, aggressive, and self-determined people. The below-par pituitary sometimes produces flabby muscles, sluggishness, and an attitude of defeat.

Glands and personality changes

The ductless glands have been a fascinating subject for scientists. Not much was known about them before World War I. Since then great strides have been made in the medical use

of hormones, but corresponding progress has not been made in learning about their effect on personality.

We do know that ductless glands *may* be a significant factor in certain personality characteristics—and, again, that they may have nothing to do with the same qualities in other people. Personality cannot be sized up by testing the glands; but whenever a previously agreeable person becomes troublesome, or whenever there is a noticeable personality change, do not overlook the possibility that the endocrines may be cutting capers. A heart-to-heart talk, or a bawling out, is exactly the wrong strategy in such cases. What is needed is an examination by a qualified medical specialist.

This is particularly true of the "let down" of middle life.

The "let down" of middle life

The hormone activity of the sex glands which gets under way in the early teen-years tapers off sometime in middle life. It stops rather abruptly at about the age of forty-five in women, often with personality changes. This is known as the change of life, or climacteric.

The climacteric often causes severe upsets in reliable women workers, producing severe headaches, "hot flashes," progressive gloominess, excitability, fatigability, dizziness, and a shortness of breath that seems suffocating. Sometimes there are flare-ups of unwarranted jealousy. Employers, as well as husbands, need to understand these changes.

Many men pass through a climacteric cycle, but about five years later than women. This explains why some good executives seem to "go to pieces" for a while in their early fifties. Dr. August A. Werner, of the St. Louis University school of medicine, an authority on the male climacteric, describes the personality changes thus: "Men become irritable, have decreased memory and ability for mental concentration, along with a seeming loss

of interest in their work." Most men are unaware of the underlying cause of these changes, or refuse to admit it.

The men may have periods when their hearts beat rapidly, which frightens some into believing they have heart disease. They may perspire or get out of breath while doing nothing more strenuous than sitting in a swivel chair. Quarrels between business partners may occur for no better reason than the peevishness and jealousies of the climacteric. Some separations of long-married couples for "mental cruelty" arise from the climacteric irritability of the husband or wife—or both.

The tricks the changing hormones play on heart, breathing, and general fatigue of mind and body make some men apprehensive. They begin to worry about old age and early worthlessness. Some quit smoking, assuming that tobacco causes their strange condition. Others think it is due to overwork, so they take a long cruise. Some, who can afford it, retire "while the quitting is good." Then, two or three years later, feeling more like their old selves, they start back in business again.

There is psychological danger in the climacteric. This period may give the person an altered outlook on life—a discouraging attitude since he may fear he is losing his mental abilities and rushing into second childhood. He has to alter his idea of himself and the way he fits into the world, and may be plunged into an attack of melancholia. You should be flexible in the estimates you form of people in this age span, for they may subsequently be completely changed, especially if they have treatment from a modern medical specialist. The climacteric in both men and women lasts from one to four years, but it can be almost completely relieved by proper endocrine extracts.

The climacteric is sometimes called "adolescence in reverse." Many of the self-uncertainties of the adolescent years occur again as the sexual hormones taper off. During the one to four years before the new balance between the glands is restored,

some readjustment of duties may be necessary to help tide the person over so there is least strain on his evaluation of himself.

Eventually the glandular system resumes good working order, despite the disappearance of one hormone in the climacteric. If the individual's self-regard has not been permanently injured during this change-over, then he emerges with a "second wind." And he may be looked upon as the elder statesman of the establishment.

Always remember you may be more wrong than usual when sizing up women in their forties, or men in their fifties.

Chapter fifteen

SIZING UP WOMEN

WHAT'S AHEAD

Misleading impressions of women
Masculine and feminine interests
Emotional characteristics
The biological background of sex differences
How life increases the differences

Misleading impressions of women

Many executives who are cautious about sizing up men, take a quick look at a woman's figure and let it go at that. If she is attractive they are likely to estimate her more favorably than her other qualities warrant. Then if she doesn't make good on the job to which she is assigned, the executive concludes that women are not suited for the work. The trouble is merely that he had not sized her up for the job as carefully as he would have sized up a man.

Appearance is more likely to be misleading with women than with men. Cosmetics, costume, and hair-do can so alter a woman's appearance that it is impossible to estimate her personality or guess her age. In addition, she is a better actor than most men. She can skillfully hide her feelings, and make her facial expression show the opposite of what she feels. This skill is an asset for work as receptionist or salesperson, but a bear trap to the employment interviewer.

The average woman excels the average man in social intelligence, and can handle herself more cleverly in an interview. She may wrap an inexperienced interviewer around her finger before he knows what has happened. She is more tactful, less blunt, than a man. She is better at side-stepping information which might show her up at a disadvantage. She will not lie more than the average man—nor less—but her lies are more subtle and difficult to detect.

One company, for instance, plagued by the loss of good secretaries because of marriage, adopted the policy of hiring girls they thought unmarriageable. News of this policy leaked through the grapevine, of course, so girls left off their make-up and engagement rings when applying for work. The personnel interviewers then began to ask them point-blank if they intended to get married.

"I wouldn't think of marrying as long as I worked for this firm," a secretly engaged applicant replied. That sounded evasive, so the interviewer continued, "Do you plan to make business or marriage your career?"

"With the current shortage of men in the world, a girl has to plan a career."

She was hired. Four months later—wedding bells.

Previous employers often give warped information about women. A spirit of chivalry prompts some men to report only favorable qualities. Bachelors and Don Juans, particularly, are usually unable to size up women impartially. Both erroneously think "all women are alike."

It is also easy to be misled in the case of exceptions—the average woman is different from the average man in many personal characteristics, but women are no more all alike than men are. Some are clinging vines and some are dominating, just as some men are sissies while others are *bruisers*. The typical woman lags behind men in her ability to work with numbers, but some

women are lightning calculators. Most women are more tactful than men, but there are a few who have the habit of saying the wrong things. The average woman is not so strong as men, but some have become professional wrestlers and truck drivers.

To size up women, we must know some of the ways in which men and women in general differ. There is no double standard in ability but there are certain interests, emotions, and other personality qualities in which each sex predominates. You will see more women in front of a show window with a basketful of kittens, more men in front of a gun shop.

Masculine and feminine interests

Women are not all alike in interests, but the typical woman and typical man are interested in very different everyday things. This is evident when they read the newspaper. Among the most frequent topics of conversation, with women, are *men, clothes,* or *decoration;* with men, *business, sports,* or *money.*

Many researches have shown other less obvious sex differences in everyday interests. Men, for instance, would rather work for themselves, women would rather work for someone else, though there are a few women who want to be independent business women. Women like full-dress parties, men are not so keen about them. And so it goes. Note the lists which show typical feminine and typical masculine interests.

Interests of Men and Women

More WOMEN say "Yes"

Do you like these people?

quick-tempered people
pessimists
people who are easily led
emotional people
talkative people
religious people
witty people
sick people
nervous people
very old people
people who talk about themselves
fashionably dressed people

Would you like to do these things?

give first aid
raise flowers and vegetables
decorate a room with flowers
organize a play
open conversation with a stranger
teach children
write personal letters
entertain others
look at shop windows
buy merchandise for a store
display merchandise for a store
live in a city
look at antique furniture

More MEN say "Yes"

Do you like these people?

people who have made fortunes
thrifty people
gruff men
cautious people
side-show freaks
self-conscious people
carelessly dressed people
men who chew tobacco

Would you like to do these things?

repair a clock
make a radio set
repair electrical wiring
operate machinery
interview clients
call friends by nicknames
be called by a nickname
chase bandits in sheriff's posse
be pitted against another in a political race
climb along the edge of a precipice

Interests of Men and Women

More WOMEN say "Yes"	More MEN say "Yes"
Do you like these amusements?	**Do you like these amusements?**
tennis	fishing
taking long walks	hunting
solitaire	driving an automobile
playing a musical instrument	boxing
picnics	poker
excursions	billiards
full-dress affairs	mechanical puzzles
auctions	sleight-of-hand tricks
fortune-tellers	chopping wood
art galleries	smokers
musical comedies	"roughhouse" initiations
symphony concerts	vaudeville
pet canaries	snakes
poetry	sporting pages
social-problem movies	detective stories
Did you like these studies?	**Did you like these studies?**
art	arithmetic
Bible study	chemistry
botany	geometry
dramatics	manual training
English composition	physics
languages	shopwork
literature	
music	
nature study	

Interests of Men and Women

More WOMEN say "Yes"	More MEN say "Yes"
Would you like these occupations?	**Would you like these occupations?**
actor	army officer
artist	athletic director
author of novel	author of technical book
bookkeeper	auto salesman, repairman
buyer of merchandise	building contractor
employment manager	carpenter
florist	chemist
foreign correspondent	civil engineer
interior decorator	draftsman
interpreter	electrical engineer
jeweler	explorer
landscape gardener	factory manager
librarian	auto racer
magazine writer	inventor
musician	labor arbitrator
music teacher	laboratory technician
office clerk	lawyer
orchestra conductor	locomotive engineer
playground director	machinist
poet	manufacturer
private secretary	marine engineer
schoolteacher	mining superintendent
sculptor	politician
secretary, chamber of commerce	scientific research worker
social worker	secret-service man
typist	ship officer
worker in Y.M.C.A., K. of C., etc.	shop foreman
	stockbroker
	toolmaker
	traveling salesman

Many industrial recreational activities, which are organized by men, are thoroughly uninteresting to women workers. Women's activities should be directed by a typically feminine woman.

The differences in masculine and feminine interests are clearly present during high school years, and they persist throughout life. Interests seldom change much, and almost never change suddenly. A sudden change usually signifies some emotional abnormality. There is one normal change among men, however: men become slightly more feminine in their interests as they become older.

Emotional characteristics

When workers want to razz a male boss, they often send him a bouquet of flowers. A woman boss, in contrast, would be flattered by the flowers.

We expect women to cry, and men to swear—though once in a while that is reversed. As a rule, however, a woman uses self-control and conceals her emotion—a trait which makes her more puzzling to size up. Occasionally she purposely turns on the tears if she thinks this will gain her ends. "Trust not a woman when she weeps," observed Socrates, who failed so utterly in sizing up women that he married the worst shrew in Athens.

"Looks" mean more to a woman than to a man. She seems to think everyone is looking at her (and she may be right), so she gives more attention to clothes than the average man. She likes her job better if she can look attractive on it, and will hunt for work elsewhere if she has to wear sloppy work uniforms. Sometimes she overdoes dressing up on the job.

The average woman is more sensitive to her environment. Weather, noise, odors may upset her. She is also more likely to be superstitious. Don't have any Number 13 machines for her to

use. She is more considerate of others' feelings, perhaps because her own feelings are more easily hurt. The boss is apt to handle her with more tact than he would a man.

She needs more encouragement than men. Her boss will get better results if he praises both good work and good intentions. A new woman worker will be less discouraged if she starts with a group of other beginners.

A woman's sense of humor is likely to be different. She may put up with practical jokes, but she dislikes them. She doesn't enjoy kidding or teasing or nicknames.

She is more likely to be loyal to her family or to her employer. She is less interested in earning big money than in working for a boss "who is nice."

Although she likes to be with groups, she is cool toward the spirit of teamwork. She seems to look upon other women as rivals, so contests have to be carefully planned if they are to avoid antagonism between women workers.

She does not change her mind more often than men do, but it generally takes her longer to make it up. She is not so good a bet as the average man for a job that requires many decisions.

Men and women are alike in honesty and dishonesty, but when lying, it is men who tell the unbelievable whoppers, and women the plausible stories.

The emotional differences between men and women have two causes: (1) bodily differences, and (2) social customs and training which force boys and girls into different kinds of behavior.

The biological background of sex differences

Some differences in bodily workings cause women to act differently from men in many situations. Women have almost a third fewer red blood cells than men. This physical difference makes them tire more quickly, so that they need more rest pauses, even for light work. During menstruation women may tire

sooner than usual. It takes a husky woman to do the work that requires an average man's muscles.

Women's hearts beat half a dozen more times each minute. Their blood pressure is about 10 points lower than man's, and they are less likely to have high blood pressure.

The average woman's stomach is a bit larger, and digests food more rapidly, so she is more likely to become hungry between meals and to need a midmorning and midafternoon snack. An empty stomach may make her irritable or restless for an hour or so before regular meal times.

Women's ductless glands make half a dozen hormones which men do not have. Some of these hormones control the menstrual cycle, and may be a factor in making women easily annoyed at periods, or may stimulate fits of tidiness and orderliness, or create a state of apprehension. The average woman's senses are more acute, making them good for inspection work. Their nervous systems have a slightly greater sensitivity. They tend to be more sensitive to coffee, narcotics, and poisons.

How life increases the differences

The world expects women to be femininely emotional, and men to be masculinely unemotional. From early childhood each sex is taught how to act the role considered appropriate for the sex. This training produces stereotypes and makes it difficult for some to be their real selves.

Two-year-old boys and girls do an equal amount of fighting and crying. But parents try to make their boys more "manly" and force them to hide sissy conduct, while girls are punished for doing "boyish" things. As a result, among children a few years older, most fighting is done by boys and most crying by girls. Boys might want to cry and girls might want to fight, but they have been taught to do otherwise.

William Cullen Bryant's father was a giant who could "take a barrel of cider and lift it into a cart over the wheel." He tried

to toughen his son into manliness by dunking him in a cold spring each morning. The son started as a lawyer to please his father, but spent more time writing poems than legal briefs. His poems "Thanatopsis" and "To a Waterfowl" show the tender side of his nature, which the dunking in ice water could not eradicate. After his father's death, Bryant quit law entirely and became a scrappy editor, fighting for the underdog—fighting the kind of tyranny which reminded him of his father's harshness. Bryant was a feminine sentimentalist at heart; the parental hardening merely made him hate hard things and did not destroy his extreme sensitivity.

Charles Parnell, "Uncrowned King of Ireland," and the man who invented the technique of the boycott, had to endure a similar hardening process. He was an undersized boy, called "Tom Thumb" by his sports-loving father, who made him dress in flimsy clothes with no overcoat in wintry weather, in order to make a "real man" of him.

General Lew Wallace's parents tried to shame him into concealing "unmanly" feelings by dressing him in girl's clothes. When he left as a weeping young volunteer for the war, his father, a West Point graduate, said, "Come back a man." Wallace tried to please his father, even following the same profession of law, but he couldn't get rid of his sentimental streak. At forty he quit the law to write *Ben Hur* and *The Prince of India.* True to the he-man teachings of his father, he put lots of blood and thunder in these novels, but they were still mushy romances filled with tears and heartthrobs.

Training and social pressure make boys and men try to conceal the soft sides of their nature. When they want to cry, they display hatred or swear instead. Being taught to conceal or alter emotions may have serious effects on personality. Speech defects, for example, may result from concealed emotional strains. Men are usually the stutterers or stammerers. Charles Parnell was a hopeless stammerer for years.

Suicide occurs mostly among men, too. Women mostly go through life's setbacks with nothing more fatal than some good crying spells, but men often accumulate the emotional back pressure that causes suicide. More men become alcoholics, and the alcoholic usually had a stern he-man father. Less serious consequences which may result from strain on boys' personalities are blustering, bragging, big talk, and threats.

These characteristics are just as emotional as woman's sympathy, crying, pity, or timidity. The difference is that men have been taught to show only certain kinds of emotion, while women have been taught to show other kinds. But don't let a man fool you—his swearing at the golf ball is just as emotional as the little woman's crying when her cake is a fizzle. And the grudge he has against a business competitor is as emotional as his wife's sympathy over an injured kitten.

The different behavior required of boys and girls from childhood has its effect on women, too. The more spirited girls rebel because boys are allowed to do things denied them. Many girls show this resentment openly, many more let it smolder inside.

Frances E. Willard, for instance, was a tomboy until her parents clamped down and made her lead a ladylike life in the house. "Mine was a nature hard to tame," she wrote, "and I cried long and loud when I found I could never race again and range about with freedom. To think I could never jump a fence again!" It was difficult being ladylike, too; she once threw a rich girl down and rubbed her face on the schoolroom floor. Miss Willard protested the world's discriminatory treatment of women and girls the rest of her life, and used her energies to fight men's privileges. The climax of her efforts to even the score was her founding of the W.C.T.U.

Our civilization has usually put the men in control, and given them more freedom and greater opportunities. Rebellion against this masculine universe motivates many young women to apply themselves so that they excel boys; girls usually run away with

the school prizes. This same intense motivation leads most women workers to apply themselves diligently in order to do better work than the men. This adds to their value as employees unless it results in tense habits of overworking. Sometimes a woman employee takes delight in showing up a man, pointing out his mistakes and laughing at his inadequacies—and that does not add to her value. Others may be suspicious, may mistrust men or take events too personally.

A few express their protest against the man's world by wearing masculine-cut clothes and trying to imitate masculine aggressiveness and rough talk, even to a low-heeled swagger as they walk. They are unconsciously emphasizing their desire for complete equality with men.

This protest is so prevalent in the minds of women that it is often good strategy for a salesman or supervisor to say, "You are doing this better than a man." And in most instances it will be the truth.

"Who is't can read a woman?" Shakespeare asked. It helps to know—and watch—the things mentioned in this chapter.

Chapter sixteen

SIMPLE PERSONALITY PATTERNS

WHAT'S AHEAD

The heart of business
The halo hazard
Personal history analysis
What we have done shows what we are
Which of these men would you hire?
The pattern revealed by the personal history

The heart of business

The human element is the heart of any business, and personality is the heart of the human element. Costs, sales, profits or losses reflect the success or failure of interactions between personalities. This interaction starts when the first money is raised for a new business, continues when an employee is hired, or a prospective customer is approached. It never ends.

More businesses go bankrupt because of "inadequate management" than from insufficient capital. Inadequate management includes not merely lack of business knowledge but also wrong personality patterns. When consultants are called in to reorganize a failing business they are amazed at the unsuited personalities found in key positions. When creditors take over a firm, changes in personnel are usually the first step. Personalities are shifted

1. LEARNING ABILITY: DOES HE GRASP NEW IDEAS RAPIDLY?	UNDERSTANDS ONLY AFTER REPEATED TRIALS UNDER SUPERVISION.	UNDERSTANDS AFTER DETAILED EXPLANATION OF PROBLEM AND METHOD.	READILY UNDERSTANDS IF PROBLEM AND METHOD ARE OUTLINED TO HIM.	REQUIRES LITTLE OR NO HELP IN ORDER TO UNDERSTAND.	NOT OBSERVED ☐
2. INDUSTRY: DOES HE WORK HARD?	DAYDREAMS OR WASTES TIME WALKING ABOUT BUILDING, TALKING TO OTHERS, ETC.	NEEDS TO BE PRODDED OCCASIONALLY.	WORKS STEADILY. IS NOT EASILY INTERRUPTED.	HABITUALLY DRIVES HIMSELF HARD.	NOT OBSERVED ☐
3. COOPERATIVENESS: DOES HE WORK WITH OTHERS FOR THE COMMON GOOD?	WON'T OR CAN'T WORK WITH OTHERS.	DOES NOT GET ALONG WELL WITH OTHERS. IS DIFFICULT TO WORK WITH.	IS A GOOD TEAMWORKER.	GOES OUT OF HIS WAY TO ASSIST OTHERS.	NOT OBSERVED ☐
4. ACCURACY: DOES HE PRODUCE CORRECT ROUTINE WORK?	ERRORS IMPAIR THE VALUE OF HIS WORK.	HIS WORK MUST BE INSPECTED IN IMPORTANT MATTERS.	HIS WORK CAN BE RELIED UPON IF HE GIVES ASSURANCE OF ITS CORRECTNESS.	IT IS SURPRISING TO FIND ERRORS IN HIS WORK.	NOT OBSERVED ☐
5. JUDGMENT: HOW DOES HE MAKE DECISIONS WHEN FACED WITH NON-ROUTINE PROBLEMS?	RASH. JUMPS TO CONCLUSIONS. FAILS TO FORESEE RESULTS OF HIS DECISIONS.	FAILS TO FORESEE RESULTS OF HIS DECISIONS ALTHOUGH HE CONSIDERS THE FACTS.	CONSIDERS THE FACTS AND MOST OF HIS DECISIONS ARE ACCEPTABLE.	MAKES SOUND DECISIONS BASED ON THOROUGH ANALYSIS.	NOT OBSERVED ☐
6. PERSONALITY: HOW DOES HIS MANNER IMPRESS THOSE WHO DEAL WITH HIM?	IS ANTAGONISTIC. REPELS OR IRRITATES OTHERS.	WOULD BE ACCEPTABLE IF CERTAIN DEFECTS WERE CORRECTED.	HAS AGREEABLE MANNER. GENERALLY ATTRACTS ASSOCIATES.	AROUSES IMMEDIATE LIKING.	NOT OBSERVED ☐

7. INITIATIVE: WILL HE ACT IN OTHER THAN ROUTINE MATTERS WHEN NOT GIVEN DEFINITE INSTRUCTIONS?	WILL NOT ACT UNLESS TOLD TO DO SO.	WILL ACT VOLUNTARILY IN MATTERS INVOLVING MINOR DEVIATIONS FROM ROUTINE.	WILL ACT VOLUNTARILY IN MOST MATTERS.	HABITUALLY SEES AND DOES THINGS WITHOUT BEING TOLD.	NOT OBSERVED ☐
8. APPEARANCE AND GROOMING: IS HE CAREFUL OF HIS DRESS AND PERSONAL HYGIENE?	SLOVENLY. OFFENSIVELY UNTIDY. HABITUALLY NEGLIGENT OF NEATNESS AND CLEANLINESS.	OCCASIONALLY CARELESS IN DRESS, CLEANLINESS, OR PERSONAL HYGIENE.	USUALLY NEATLY AND APPROPRIATELY DRESSED AND WELL GROOMED.	SUPERIOR STYLE, GROOMING, DRESS, AND SENSE OF THE APPROPRIATENESS OF THINGS.	NOT OBSERVED ☐
9. ATTITUDE: HOW DOES HE FEEL TOWARD HIS JOB, HIS FUTURE, AND THE COMPANY?	IS RESENTFUL OR DESTRUCTIVELY CRITICAL. IS 'SOUR' ON HIS JOB OR THE COMPANY.	LACKS INTEREST. IS INDIFFERENT TOWARD HIS JOB, HIS FUTURE, OR THE COMPANY.	FEELS 'GOOD' ABOUT HIS JOB AND HIS FUTURE. IS LOYAL TO HIS SUPERVISORS AND THE CO.	EXHIBITS KEEN INTEREST IN HIS JOB. FEELS HE IS 'GETTING SOMEWHERE' BOOSTS THE COMPANY.	NOT OBSERVED ☐
10. EMOTIONAL BALANCE: HOW DOES HE REACT TO ADVERSITIES AND TURNDOWNS; TO ADVICE AND CENSURE?	'GOES TO PIECES' WHEN CRITICIZED. IS SHORT TEMPERED. 'BLOWS UP' EASILY.	MOODY AT TIMES. IS EASILY EXCITED. IS 'TOUCHY.'	FEELINGS ARE NOT EASILY HURT. HAS SELF CONTROL.	IS CALM DURING CRISES. NEVER LOSES HIS TEMPER. IS PATIENT.	NOT OBSERVED ☐

11 HAS THIS SALES TRAINEE HAD THE OPPORTUNITY TO CONTACT CUSTOMERS?_____ IF SO:

DID HE HANDLE HIMSELF SATISFACTORILY?_____. DID HE COMMAND RESPECT?_____.

DID HE GIVE THE APPEARANCE OF KNOWING THE LINE?_____. DID HE THINK QUICKLY?_____.

Rating form for sales trainees, showing the personality qualities valued by a successful large sales organization. (Courtesy Sidney W. Koran, personnel manager of United Merchants and Manufacturers, Inc.)

around, and some are shifted out. A few new faces appear in some higher jobs. New personalities put the business back on its feet.

Personality gives power to the use of abilities, or it may take power away from abilities. But the amateur often fails to estimate the personalities that will give the best results in business.

"There's something about him I don't like," the old-time boss said to explain why he did not hire an applicant. That "something" he didn't like was part of the applicant's personality. It may, or may not, have handicapped him on the job. Such rule-of-thumb estimates tell more about the boss's likes and dislikes than they do about qualifications for the work. When we say, "Bernice is a sweet girl," we are revealing what we think is sweet, and not sizing up Bernice at all.

When a foreman reports that Oscar has more initiative than Gene, there may actually be no difference between them—or Gene might even have more initiative. The differences sometimes have to be big enough to hit one over the head before they are noticed. It is not rare for an employee to slump into a complete nervous breakdown before his boss suspects that anything is wrong.

The halo hazard

We have an understandable tendency to judge people we like a shade or two too high. Those we have known closely for a long time are also estimated too high, perhaps because we "get used to them" and ignore their weaknesses. The general impression we have of a person shines like a halo and casts its light—or shadow, as the case may be—over all his qualities.

This "halo hazard" is greatest in estimates of one's close friends. Friends seem a bit better looking, a bit more intelligent, than strangers would judge them. Like love, friendship magnifies

Personality pattern of successful clerical workers

1. Do you have a more nervous temperament than the average person ____
2. Do you shed tears with little provocations ____
3. Does your mind frequently wander so you lose track of what you are doing? ____
4. Are you easily offended when discussing certain topics? ____
5. Do you ever criticize a workman who fails to have your work ready when promised? ____
6. Do you gain a better understanding of problems by studying them out alone than by discussing them with others? ____
7. Do you enjoy investigating strange places? ____
8. Do you dislike to ask others for advice? ____
9. Do you prefer to be alone when under emotional strain? ____
10. In case of accident, do you immediately do something to help? ____
11. Have you been chairman or leader of a group recently? ____
12. Do you prefer to have entire responsibility rather than share it with someone else? ____
14. Do you enjoy telling others of your good fortune? ____
15. Do you feel you might get in a rut if not stimulated by contacts with successful people? ____
16. Do you tend to be radical rather than conservative? ____

Successful clerical workers have mostly "No" answers to these questions.

Freedom from worry is shown by the first three questions.

Questions 4 and 5 reflect an *even-temper.*

Questions 6 through 9 indicate a lack of *self-sufficiency.*

Unwillingness to accept responsibility is behind questions 10, 11, and 12.

Can you figure why some of these qualities help clerical workers? What occupations are there in which the same qualities might not help?

(Questions based on the work of Dr. Arthur F. Dodge.)

virtues. Although we know old acquaintances best, we overlook more. We are poorest judges of people we know best.

Long-service employees who have slowed down from age, for instance, are still generally judged higher in physical vigor than newer, younger employees. And qualities which would be annoying in a new employee are not noticed in the one we are used to. While this tendency may make marriages happier as the years go by, it adds to business inefficiency. We get used to associates and ignore many of their slight personality disqualifications for the work—when we should try to help them change their liabilities into assets.

Blunders of this sort can be avoided by looking for tangible signs of personality qualities. In short, (1) know what to look for, and (2) how to look for it.

Personal history analysis

Personal history analysis was one of the first psychological methods devised to improve judgments of personality. It deals only with tangible aspects of personality, which everyone can note. This very characteristic means that it neglects some of the important inner aspects of personality, but in this and the following chapter we will keep close to the tangibles of personality.

The personal history analysis was started when psychologists noted that married people did better on some jobs than single people, while on other jobs tall people were better than short people. Compilations were made of readily noticed qualities among workers who made good, and these were compared with the same qualities among workers who did not make good.

One of the studies Dr. Oliver A. Ohmann made for the Standard Oil Company of Ohio shows how this works. He looked for the personal history items which predominated in their best

service station attendants but which were inconspicuous among the poorest attendants.

Most of the best attendants were married, and the poorest were usually divorced or separated. That suggested that there is something about being successfully married that is associated with the personality of a good service station attendant. The relative importance of marriage as an indicator of job fitness was computed, and a weight or score given it—the higher the score, the more favorable. The following list shows the scores for service station attendants in the Cleveland district:

Marital status	
Single	2
Married	4
Other	1
Number of children	
Single	2
Married, none	4
1 to 2	3
3 or more	1
Previous station experience	
Yes	4
No	2
First job	3
Reason for leaving last job	
Friction	2
Dismissed	3
Slack business or firm liquidated	3
Self-improvement	5
Others	0
First job	3
Owns home?	
Yes	1
No	3
Age	
15 to 20	2
21 to 25	5
26 to 40	3
41 and older	0
Earnings on jobs	
Increased	2
Steady	3
Fluctuated	5
First job	4
Type of last previous employment	
Unskilled	1
None	2
Factory	2
Building trades	2
Farmer	3
Office	3
Sales	5
Others	4

Height	
5′4″ to 5′11″	3
6′ and taller	4
Tenure last job	
0 to 1 year	2
1 to 2 years	3
2 to 4 years	5
4 or more	2
First job	4

Tenure on average of all previous jobs	
0 to 2 years	2
2 to 3 years	5
3 to 5 years	3
5 or more	2
First job	4
Education	
Grades 4 to 11	3
High school graduate	4
Special courses	3
Any college work	2

What we have done shows what we are

Several sidelights on personality patterns are shown by those scores. Remember the scores were not guessed at, but computed by mathematical methods. We might guess in advance that it would be in a man's favor if he owned his own home—but for this occupation it turns out not to be an advantage.

Discharge from previous job does not give so low a score as quitting because of friction with boss or workers. Our first hunch might be that quitting was a more favorable sign than being fired, but the facts do not work out that way. Quitting because of friction may mean that the man is difficult to satisfy, or that he was the fellow who caused the friction. In either case, he might cause similar friction on a new job.

In sizing up people it is vital to know not just that they quit a job but why. The applicant will always have some plausible self-justification for quitting; hence it is wise to check with his previous employers to get another side of the story. These checks should be made over the telephone or in person: previous employers will state facts orally which they hesitate to put in

writing. Applicants always try to put their best foot forward, even if they do not lie, and it is always wise to keep an open mind until the facts are checked at an impartial source. In one Civil Service examination in New York City, for instance, the 8,446 applicants swore they had no criminal records—yet a fingerprint check showed that 181 of them did.

High school graduates ranked higher for service station work than those who had been to college. Since the amount of schooling is a rough indication of intelligence, apparently one can have too much intelligence for this work. On the other hand, unskilled laborers have low scores. In an interview, the person with slight education is likely to add a year or two to his schooling. When education is important for a job, it should always be checked at the school offices. A high-up government official was recently let out because he claimed graduation from two colleges which he had never attended; a college degree was a requirement for his position, and after he had held it for some time a routine check by the FBI revealed his deceit.

Several of the personality history items are interrelated, as all personality is. Why, for instance, should a man with an average tenure of five or more years on all his previous jobs receive a low score? The answer is in another item. The long tenures are naturally mostly among the older men—while the best scoring age is twenty-one to twenty-five years. It is the same with those who have three or more children. The larger number of children may mean either that the father is in the older age group, or that he married foolishly young and is impulsive.

Past events in one's life give many such indications about personality, and the events may leave marks which alter the course of further personality development. Personal history items are useful, impartial guides. However, they do not tell all about a person. A scoring that is right in one territory may not be the best for another location. And a scoring for one occupation does

not apply to another. This method is widely used in sizing up prospective insurance salesmen, for instance; but a city salesman is scored differently from one in farm districts.

Bear in mind that the scorings are not made by guesswork, or by simply looking over the histories. It is an involved job in scientific mathematics to find how the tangible facts fall into a pattern which typifies success in a certain occupation. But once a scoring is developed, the personal history analysis is easy to use.

Which of these men would you hire?

As an example of the ease of using this method, size up the suitability of these two men for service station jobs:

Frank G.	Scores	Lowell R.	Scores
He is a widower	1	He is married	4
with 3 children	1	and has no children	4
No previous experience	2	No previous experience	2
Left last job because of slack business	3	Left last job for better one	5
Owns his home	1	Rents apartment	3
Is 42 years old	0	Is 23 years old	5
Earnings steady	3	Earnings varied	5
Last work in factory	2	Last work in grocery	5
5'10" tall	3	6' tall	4
Held last job 1 year	2	Held last job 2 years	5
Avg. tenure 1 year	2	Avg. tenure 2 years	5
7th grade education	3	High school graduate	4
Total score	23	Total score	51

Lowell R's score is twice that of Frank G. That does not mean Lowell R. would make twice as good an attendant. Scores can seldom be used that way. They do not start from zero, but are like a yardstick that has the first few inches missing. But the total scores can be understood in terms of percentiles or quartiles.

Ninety-five per cent of the men who score 51 or higher make good on this job—that is a good sign for Lowell R. But only 1 per cent who score less than 23 make good—that is an unfavorable sign for Frank G.

Here is the way district employment managers were told to interpret the total scores:

42–up	Very favorable risks
39–41	Favorable
35–38	50-50 chance of success
33–34	Red light! Doubtful.
0–32	Do not employ.

Frank G. might belong to the same lodge as the manager, and the manager might like his general personality. But the impartial personal history scoring is not influenced by prejudices or halos.

The score does not guarantee that Lowell R. would make good. He might be too fumbling to unscrew a gas tank cap, so nearsighted he couldn't see an automobile that drove up, or so weak in number ability he could not make change. He might have the habit of making offensive remarks to patrons. But his high score tells the manager that if other things are favorable, then Lowell R. is the better man for the job.

The pattern revealed by the personal history

The personality pattern most likely to fit the demands of a job is shown by the personal history scores. They give a picture of the sort of person to seek: a young married man, reasonably tall, without children, who rents his home and does not have excessive financial obligations, who is a high school graduate with some sales experience, who has had two or three previous jobs but who has shown ability to stick to each for a couple of

APPLICATION FOR POSITION

of

PACKARD SALESMAN

Information is confidential. No inquiries will be made without permission.

PERSONAL INFORMATION

Name in Full_____ Date_____

Present Address_____ Phone_____

Date of Birth_____ Place of Birth_____ Are you an American Citizen?_____

Family Status: ☐ Single ☐ Married ☐ Widowed ☐ Divorced ☐ Number of Children ☐ Other Dependents

Social Security No._____

EDUCATION ☐ Elementary School ☐ High School ☐ College ☐ Other

Years completed:_____

EMPLOYMENT

Are you now employed?_____ Reason for desiring change_____

Beginning with present or last job, give employment record for past five years. Include military service and periods of unemployment.

From	To	Company and Address	Immediate Superior	Your Job	Earnings

SOCIAL ACTIVITIES

List social, fraternal, community or other organizations to which you belong:_____

Hobbies or spare-time activities:_____

REFERENCES

Give names, addresses and phone of three businessmen or other employed persons to whom we may refer. Do not list relatives or former employers.

Why would you like to work for us?_____

Please sign here_____

(Courtesy Packard Motor Car Co.)

APPLICATION BLANK RATING GUIDE
FOR
PACKARD SALESMAN

FACTOR	WEIGHT
1. AGE:	
Under 21	0
21 to 25	2
26 to 35	4
36 to 45	2
46 and over	0
2. FAMILY RESPONSIBILITIES:	
Married (or widowed)	3
Divorced (or Separated)	1
Single	0
TOTAL DEPENDENTS:	
One, two or three	4
Four or more	2
None	0
3. EDUCATION:	
Eighth grade or below	0
1-3 Years High School	1
High School Graduate	2
1-2 Years College	4
College Graduate	0
4. PRESENT EMPLOYMENT STATUS:	
Employed	2
Unemployed	0
5. NUMBER OF JOBS LAST FIVE YEARS:	
One	3
Two or three	2
Four or more	0
6. TIME UNEMPLOYED LAST FIVE YEARS:	
Never unemployed	2
Unemployed any considerable time	0
7. ACTIVE MEMBERSHIP IN SOCIAL OR FRATERNAL ORGANIZATIONS:	
Yes	2
No	0

How the application is scored for this particular job. The total should be at least 12. Those who score lower than that do not make successful salesmen.

years, and who has moved from one job to another either to improve or because of conditions beyond his control.

Can you picture this person? He has some obligations and responsibilities, but not a houseful of children to add to his financial burdens. He has shown ambition to get ahead, and has not made impulsive changes which reflect poor judgment.

Seemingly slight events in one's past tell the alert observer a great deal, and profoundly influence personality. A young man who lives at home with his parents does not think and act the same as he does when he is married and trying to earn payments on his furniture. Personality reflects environment in many ways. And many little things—such as education, marital status, and age—are personality aspects the amateur observer often overlooks. You must extend your notions of personality to include them.

Chapter seventeen

ESTIMATING TRUSTWORTHINESS

WHAT'S AHEAD

A San Quentin story
Prevalence of crooked streaks
Methods of sifting out the untrustworthy
How crooked streaks are formed
The Biographical Case History
Significance of the biographical items
What a score indicates
Suspected, but acquitted
The typical embezzler

A San Quentin story

Number 489452 was a gay bachelor of thirty-three, back in San Quentin prison for the second time, and for the same reason—Hollywood starlet trouble. He was a competent office worker, a bit above average in intelligence, and below average in size and personal appearance. The pretty starlets fascinated him. For years he had been a lone wolf, friendly with one starlet, then another, but never finding the one-and-only that was "made for him." In wooing a starlet he would buy her gifts which he charged to others' store accounts. That was why he was back in San Quentin—for fraud.

Like most people who keep getting into the same jams, No. 489452 had a plausible theory of why he did it. He thought it was because his small stature and plain appearance gave him an inferiority complex which made him want to spend money like a big shot. Like most self-diagnoses, it was partly right, partly wrong.

There were several factors that might have headed him on a crooked way. His parents were divorced, and he was raised by his mother and grandmother, neither of whom could read and write. They had taught him to hate his father, yet he had no special love for them either. More attractive young uncles and aunts overshadowed him in his home. When company called he was pushed out of sight, like Cinderella. As a teen-ager he was shy around girls, but he worked hard in school to gain better grades than his uncles and aunts.

Dr. Rudolf Lassner, then senior psychologist of the prison guidance center and now of the Lucas County (Toledo), Ohio, Child Study Institute, used the psychodrama method to find other reasons which made the prisoner go wrong.

The psychodrama, or spontaneity theater method, was originated in 1921 by Dr. J. L. Moreno, a Viennese psychiatrist who is now a United States citizen. In a psychodrama people act out a series of roles related to their troubles, improvising as they go along. This spontaneous acting is used to train salesmen and foremen; they can better understand how the other person feels when they act the part, for example, of customer or employee. In San Quentin it was used to give prisoners more understanding of the reasons for their trouble, and thus to help them keep out of trouble in the future. When acting, they revealed past experiences which hurt them deeply at the time.

The bachelor with starlet fever acted out one scene from his school days in which a schoolmate made fun of him. He also acted in a skit, made up as he went along, showing how he

met his latest starlet friend. Other prisoners in the therapeutic theater took the girl's role. Then the same scene was reenacted with the bachelor himself acting the starlet's part. By acting the part of his girl friend he soon realized she had been a gold-digger who looked upon him as a sucker. When the roles are reversed in this way, the individual acquires insight into the way his conduct looks to an outsider.

This insight is helped along by comments and advice volunteered by the psychologists and others who are watching the spontaneous playlet unfold. These "kibitzers-with-a-purpose" give advice audibly while the play is being acted, and hold post-mortems afterwards—much as fans comment during and after an athletic contest. In the psychodrama, they do not comment about the acting skill, but upon the motives and good sense of the conduct being portrayed. People will take criticism about a role they are acting, but not about what happened in real life, even though the role and real life are one and the same thing.

As these acting and kibitzing sessions continued, No. 489452 began to realize that the fundamental cause for his misconduct was his strong need for the emotional attachment of one woman. His shyness kept him from making the acquaintance of women except those who were too easy to get acquainted with. He had tried to find affection by buying it—with other people's charge accounts.

He has resolved when his sentence is completed to search for friendship among people who appreciate him for what he is, rather than for what he buys them.

Prevalence of crooked streaks

There are staggering losses from small thefts and little frauds in all businesses. Casualty firms estimate that crooked employees cost business about 300 million dollars a year. No estimates are

available of the sums lost by the general public through short-changing, but they are sizable in larger cities and in places where people buy tickets or pay checks in a hurry.

Some employees seem to view dishonesty as a game, trying to see if they can beat the checking system. Some have a vengeful motive, like the employee who justified helping himself by saying he was underpaid. Young children often steal from neighbors for no better reason than to get even with their parents—employees sometimes do it to even things up with the boss. Hotel towels disappear partly because patrons feel they are overcharged.

Small-scale pilfering becomes a tradition with some groups. High school athletic coaches are aware of this; the alert ones inspect players' luggage as they leave the hotel on the first out-of-town trip, returning the "souvenirs" and explaining to the team that honesty is a part of sportsmanship.

One eastern drug chain which had a $1,400,000 inventory loss in six months, used lie detectors on its 1,400 employees. It was found that nearly three-fourths of the employees had been helping themselves to merchandise and petty cash. This was a higher percentage than usual.

Such surveys indicate that small-scale theft and cheating is prevalent among about 60 per cent of the population. This percentage holds for small businessmen as well as for workers. It was found, for instance, that 63 per cent of garages charged for unnecessary repairs, or for repairs they did not make; 64 per cent of radio shops did the same; so did 49 per cent of watch repairmen.

About one-third of college students cheat on examinations. And about the same percentage of public school teachers cheat on their examinations for teaching certificates.

The fact that college students and schoolteachers have about

half the dishonesty percentage of small businessmen and workers reflects the tendency for trustworthiness to increase as intelligence increases. General dishonesty is most marked among people with low intelligence—another reason for having people of high IQ as employees or personal friends. But don't overlook the fact that big swindles are put over by highly intelligent people—like F. Donald Coster, an ex-convict who became president of a large drug firm and swindled it out of 10 million dollars over a fifteen-year period.

The professional crook takes all he can on one trip, but the slippery employee lifts his loot in small pieces, over a long time. It may be $10 this week, nothing next week, $25 the third week, and so on. He is started, and can't stop. That is typical of most untrustworthy behavior. A few little offenses go undetected, and are repeated with more confidence. Perhaps the employee imagined he was "borrowing" that first $10, and would quietly repay it. But after a few repetitions it will be difficult either to repay the takings or break the habit. Untrustworthiness also gives a feeling of guilt which causes anxiety and general emotional tenseness.

Methods of sifting out the untrustworthy

Most people can be trusted most of the time. No. 489452 could be trusted until he took a shine to a pretty starlet. He was honest in the office, but slippery with charge accounts in swank shops. There are others who can't be trusted at all.

In sizing up prospective employees there is usually an attempt to sift the trustworthy from the deceitful. The seasoned interviewer is alert for indications of past cheating or dishonesty. He takes nothing for granted, and cross-examines applicants, especially those who:

1. Hem and haw or hesitate before answering
2. Go into too much circumstantial detail about previous earnings or experience
3. Have ready alibis for unfavorable reports
4. Give evidence of living or dressing beyond their means
5. Have unexplained gaps in their employment records

The experienced interviewer knows that about one-third of applicants claim more job experience than they have had. He watches for some proof of the experience, such as toughened hands in the applicant who claims he has been a machinist or carpenter.

The wise interviewer has personal friends in other firms in his locality, and telephones them for a quick check on applicants who claim to have worked for them. His friends will give information over the telephone they would not care to put in writing. Police departments are often used for checking an applicant, but their information requires a personal visit since it will not be given over the telephone in most cities.

The interviewer may say, "Come back later," when he wants time to check statements and claims. In the past this was the only way to play safe—and it still missed information about many people who were potentially untrustworthy. Now it is possible to estimate whether an applicant has a latent crooked streak by getting biographical information from him. To understand how this can be done, we must first see how crooked streaks happen.

How crooked streaks are formed

Temptation does not make crooks. The potential crook looks for temptation. Bad companions do not make crooks, although people with budding crooked streaks often prefer bad companions. Actual need seldom causes crookedness. In embezzlements, actual need is a factor in only about 2 per cent of the

cases. Some firms have provided emergency loans for employees to remove the motive for theft. While these loans are desirable in many crises, they are practically valueless for preventing defalcation.

The crooked streak is due to motives within the person that make him go against his common sense and help himself to another's property. These deep motives make him rebel at restrictions. There is none of the alleged "weak will" in the crook. He has strong driving forces inside him which push him in undesirable directions. He may have a queer yearning to be caught and punished. There may be a thrill in it for him, and the fact that he has chances of being caught adds to the thrill.

Trustworthiness, or the lack of it, is acquired, not inborn. Crooks are made by acquired motives which make them hunt for temptation. These motives are slowly built up by things that happen to them in life—and the way these happenings affect them. The bachelor with starlet fever is an example. If his mother had loved him, and if he had not been taught to hate his father, the starlets probably could not have tempted him to buy fraudulent gifts for them. Events early in life foreshadow a person's path, and make it possible to predict whether he will take the crooked way.

The Biographical Case History

Dr. Gilbert L. Betts, personnel consultant of Minneapolis, and editor for the Educational Test Bureau, has used the events which mold character as the basis for a test of incipient crookedness. Dr. Betts contrasted nearly 1,500 prison inmates with an equal number of people of like ages and general condition who had not shown crooked motives. A large number of events or circumstances in the lives of these two groups were analyzed. There were 67 items which showed consistent differences, and

these were used to construct a Biographical Case history which shows how a person is motivated to do prohibited things.

Some of the 67 happenings were beyond the control of the individual, such as having a father who was unable to hold a job, drunkenness in the family, or a broken home. Other items show attitudes or reactions to life's happenings, as when an individual thinks people talk about him, or that he was picked on by his teachers.

In the copyrighted test formulated by Dr. Betts, the items are arranged as groups of questions to which the answer "Yes" or "No" may be given; the more favorable answers an individual gives, the less likely he is to be or to become a crook. The material which follows has been simplified from the test, and the items are stated as *conditions favorable to trustworthiness*, which may be "True" or "False" in the case of the individual you are sizing up.

Family and early home life

My mother did not work away from home
No members of my family have been in prisons, asylums, or other institutions
My parents were not separated or divorced
I was raised by my own parents
At home we were interested in the same things, and usually did them together
My father had an eighth grade or higher education
My mother had an eighth grade or higher education
We lived in one house over ten years
My father and mother usually agreed with one another
My father stayed on one job more than ten years
My family's recreational time was spent mostly with hobbies, or athletics, or movies, or reading and intellectual interests
When I was a child, my parents were neither very strict nor very lax with me
My father's profession was business or professional, or farming, or lumbering
My mother was usually strong and healthy

Members of my family never got drunk
My parents spoke English

Let's take a moment to see what these mean. If each of those statements is true of a man, it is a good sign his early family life helped develop motives which will make him trustworthy now. But if many of the opposite conditions prevailed in his early life, it is an unfavorable sign. In the case of No. 489452 at San Quentin, and of F. Donald Coster, for instance, many of those statements are false.

This is an example of what the early family life might have been like for a man if none of the conditions just listed prevailed: Mother worked away from home; brother had been in jail; parents separated; raised by an aunt; family not interested in same things; father finished only fifth grade; mother finished third grade; moved, so seldom lived in one house more than a year; father and mother always arguing with each other; father seldom held job longer than a few months; family recreation mostly card playing; parents harsh in discipline; father's work day labor; mother sickly; family drank heavily on pay nights; parents spoke foreign language to each other.

Here are some other conditions considered in the Biographical Case History.

School experience and reactions

I started school at the usual age
My grades were at least good
I was either infrequently tardy or absent
I did not change schools very often
I quit school because I didn't have the money to go on, or because I graduated
I did not fail any grades
I graduated from high school
I was never sent to the principal's office more than twice
No more than one or two of my teachers were hard to get along with
When in school I cared about my personal appearance

Here is a potential crook for whom all those statements are false: Started school at seven; grades were mostly below average; played hookey many times; family moved often, so attended many schools; quit school because he thought an education not important; had to repeat fifth grade; left after two years in high school; sent to principal's office regularly; most of his teachers seemed hard to get along with; never worried about his shabby clothes in school. Can you picture him?

Early attitudes

My parents seemed to show no favoritism in the family
I had little trouble controlling my temper as a child
Other children picked on me as they did on others
As a child I was sometimes shy
I seldom had trouble getting along with other children
As a child I never ran away from home
My feelings were sometimes easily hurt
I had several hobbies or interests
Up to the age of six I had no severe illness

Can you picture an individual who had those attitudes in childhood? He is probably a trustworthy adult. But now picture the opposite: Parents babied an older sister who was their favorite; used temper displays to get what he wanted; other children picked on him considerably; was a bold child, daredevilish; had trouble getting along with playmates; ran away from home several times to frighten parents; got so his feelings were hardened and never hurt; no boyhood hobbies; remembers severe illness when he hoped he would die.

Picture two people again, one of whom the following conditions are mostly true, and one of whom they are not.

Social attitudes

As a child I was sometimes uneasy at parties
In school I belonged to a few clubs and organizations

I now belong to one or more lodges, clubs, or organizations
My friendships are closest with men, or equally close with men and women
I seldom find it hard to keep the friendships I desire
I usually attend sports contests when I have the chance

Attitudes toward people

I have not been double-crossed by people very often
I usually try to find someone to go with to the movies, shopping, etc.
When around people I talk an average amount
In the past five years I have never been in trouble for fighting
I am not troubled with gossip
I have not been separated or divorced

Work attitudes

I have usually been able to earn a good wage
I have worked on only a few different jobs during all my life
For the most part my work has been a business or profession
I have seldom been unemployed
On the average I have held a job a year or longer
I have never been fired from a job
I have usually been happy in my work

Attitudes toward self

My memory is as good as ever
I seldom have trouble keeping my mind on what I am doing
I worry over possible misfortunes a little
I have not had serious sinus trouble
I never have trouble going to sleep
I have seldom been in debt
I can usually find something to do in my spare time

Citizenship

I have never been arrested
I drink only occasionally, or never
I have voted in a city, county, or state election
I do not find it hard to keep from gambling too much

Significance of the biographical items

Those 67 items give a picture of the experiences which direct a person toward normal motives, and of the attitudes a normal person has toward the stresses of daily life. The man with normal motives has adjusted his desires to the restrictions imposed by the group in which he lives and works. He has his impulses well in hand.

The opposite experiences and attitudes give the individual a crooked bent. He has reacted too strongly to some of the strains of life—or had more strains than he can handle. For instance, some self-consciousness about appearance is all right for school children, but extreme self-consciousness, or brazen lack of any, shows some disorder in motives.

The average person may have trouble describing himself on some of the items, such as whether his parents showed favoritism to another child. But the incipient cheater can answer this readily if there was favoritism because he overreacted and remembers it too keenly. The crook is still nursing the grudge which warps his attitudes.

The potential crook is largely motivated by irritations from his past experiences. He keeps stumbling over past annoyances. The normal person forgets last year's irritations, while the one who is out of step is still fighting his battle of all the past years—fighting them inside himself. The more of these past battles he remembers, as shown by the Biographical Case History, the more difficult it is for him to get along with society.

Many of the attitudes in the second half of the list can be changed with a little effort. Often there are spontaneous changes, which indicate a better inner adjustment. People who have been lone wolves, for instance, may start going to the movies with a companion or a group. While many of the attitudes can be changed, the sad truth is that they seldom are.

What a score indicates

In the Betts test high scores are favorable scores. Each statement which can be answered "Yes" counts one. The highest possible score is, of course, 67.

The dividing line is at score 40. At this point the chances are fifty-fifty that an individual may be motivated toward criminal behavior. The person who scores 50 or higher is almost certain to keep out of the criminal class.

As the score goes below 40, the chances increase rapidly that the person will eventually turn to crime. Men who are in prison for the first time have an average score of 34. Those in for the second or third time have average scores of only 28.

The average soldier in World War II had a score of 47—safely above that dividing line.

It is a hazard to employ a person with a low score. And the person with a low score should visit a specialist to get expert help in untangling his hidden motives before he gets into trouble. Only a clinician with a doctor's degree can be trusted for such untangling. One can be located through the department of psychology or psychiatry at the nearest large university, or help may be had from the Veterans Bureau. The police department, family physician, attorney, or clergyman, cannot give the sort of help that is needed.

Suspected, but acquitted

Many things which are often thought to be possible causes of crookedness were found in the Biographical Case History to be of no consequent. For instance:

It made no difference if the father or mother died before the child was grown up

It made no difference if he was undersized or oversized in his early years
It made no difference if he felt inferior or if he felt superior to other children
It made no difference if the family lived in crowded quarters
It made no difference if he stuttered

Many items dealing with health were tried out, but showed no relation to criminal conduct. Ear trouble, asthma, heart trouble, rheumatism, foot trouble, goiter, hay fever, rupture, back trouble, tuberculosis—none were significant. What one thinks rather than what one undergoes counts for more in forming character motives.

Many employers and bonding companies secure information from police and court records before accepting promising applicants. (They could have found F. Donald Coster's fingerprints if they had looked for them.) This spots recent records of bad checks, domestic trouble, drunkenness, disorderly conduct. Credit bureau reports also warn of those living beyond their means. But bad debts and police records cover only 5 of the 67 items.

The typical embezzler

The embezzler usually has no previous police record. He is about thirty-five years old, married, with a couple of children. He earns enough to live comfortably. The company usually has a high regard for his work, and he has been on the job five or more years. To all appearances he is a desirable employee with a secure future, and may be looked upon as a pillar of society. Yet inside his head he is fighting battles with himself. The employer does not know about these conflicting motives—but could have suspected them if he had studied the man's Biographical Case History.

This average embezzler takes money, or merchandise, for two

or three years before he is caught. He usually feels better as soon as he is caught, for there is often a queer element of self-punishment mixed in with his crooked motives. He takes some $6,000 before he is found out, and by that time most of the money is gone. It may have gone into slot machines if he had a neurotic desire for luckless gambling. It may have gone to buy gifts in a maladjusted attempt to win the affection he felt was shown others in his childhood, as was the case with No. 489452.

The usual motives assigned by the police are gambling, women, high living. Those tell where the money went, not *why* there was an uncontrollable impulse to take it. There is always a reason, but police, employers, and the pathetic embezzler himself seldom understand it. The reason was not a chance to "dip into the till"; it lay in motives left over from early experiences. Dishonesty doesn't appear suddenly, any more than mechanical skill suddenly blooms at age thirty-five.

None of the safeguards taken to prevent defalcations or petty thievery remove the motives. In some cases, in fact, they make it a game to beat the system. The motives need to be looked into—not the false motives of wine, women, and gambling, but the real motives of battles with one's past experiences.

In sizing up anyone, the items listed in this chapter should be kept in mind. Dishonesty doesn't show in one's face, or by an evasive glance, but it does show up in one's past.

How about lie-detector tests for telling whether or not a person is trustworthy? These lie-detector tests are made by an instrument—polygraph is its name—which records breathing and pulse rate while the person is being asked questions in which his honesty is involved. If the suspect lies, there are characteristic changes in his breathing and pulse. He cannot fake breathing and pulse to conceal his lie.

Such a test tells whether or not the person is telling the truth

about the particular question being asked him. It does not tell whether he is trustworthy in other regards.

It takes an expert to use one of these instruments, and especially to evaluate the changes in breathing and pulse which tell the story. But business is making wide use of these tests, using the services of the half-hundred firms of consultants who specialize in this work. Insurance companies and banks are the biggest users of these consultants; one check-cashing company is said to have lowered its losses 40 per cent by using lie-detector tests before cashing doubtful checks.

Your police department, or the psychology department at your state university, can direct you to consultants qualified for this work. In the meantime you will have to trust the story of the person's past behavior to tell whether he is generally trustworthy.

Chapter eighteen

TELLTALE PERSONALITY INDICATORS

WHAT'S AHEAD

A "sixth sense"
Observe ways and habits
Give-away gestures and facial expressions
The Patterned Interview
Which would you hire?
Checking the clinical method
Some minor pecularities to watch for
Compulsions—"I didn't want to do it"
Gambling, stealing, and fire setting
Obsessions—"I can't get the idea out of my mind"
Phobias—"I don't know what makes me afraid of it"
Tics—"I wish I'd quit drumming the table"
Don't try to stop them

A "sixth sense"

Anyone can "read" some personality traits. It is not difficult to tell when a person is extremely sad or happy, mad as a wet hen, or timid as a mouse. The difficulty is that people are not usually either completely angry or completely happy. Since personality traits are usually shown in moderate or weak degrees, and crop out only from time to time, it is an art to spot their existence. A

knowledge of human nature's ins and outs, plus experience in looking for telltale signs such as fleeting changes of expression, gives some people a sort of "sixth sense" for sizing up others.

Different occupations often leave their marks on people. These marks can be read after observing the person under suitable conditions. One employment interviewer, for instance, amazed applicants when he observed, "You have been a farmer," or "You have worked as a mechanic." Usually he was right, for he had noticed that farmers were apt to sit passively waiting their turn to be interviewed, while mechanics would show alert curiosity about what was going on in the waiting room.

The possibility of reading such telltale signs should not be confused with everyday hunches, which may or may not be correct—or with prejudices, such as Munsey's dislike of fat people. This "sixth sense" is an ability that results from having a world of knowledge about human nature stored away in one's head. That knowledge is best gained in two ways: by extensive reading in psychology and psychiatry, and by observing applications in everyday life. It is not gained by watching a few people and then jumping to conclusions.

Observe ways and habits

When a stranger starts to argue the first time he speaks to you, and keeps right on arguing, you suspect it to be a habit with him. Or, if a woman giggles, gesticulates, and talks so rapidly about nothing that you can't push a word in edgewise, you may decide she is too high-strung to work in an office. Most people are not such clear-cut extremes. Furthermore, they are usually on good behavior at first meetings and may put on false fronts that give a misleading impression. But it is possible to look behind the false front and note personality qualities which the person may not realize he has.

Every person has ups and downs in personality characteristics.

These high and low spots are not usually so marked as with the arguing stranger or the gesticulating woman, but the variations are there and worth discovering. So-called average folks vary from each other in mannerisms and attitudes which reveal their particular degree of the Primary Temperamental Qualities described on pages 141–142.

After we have been around a person for some time we may become aware that he has traits we did not suspect at first. And we also notice that some people display their emotions or moods differently from other people. In one office, for instance, everyone knew it was wise to stay away from the boss when he came in wearing his hat on the back of his head, for that meant he was in a bad mood. Those around Napoleon knew that when he was calm it was a sign things were going wrong, but when he was excited things were going well. And when musician Rubinstein talked through his nose it was a sign that he was angry.

Give-away gestures and facial expressions

Most people are ignorant of their own personalities, not realizing they have many features that are more developed than others, features which make them individuals. Personality includes not only what they want to do, but also what they do in spite of themselves. There are many give-away gestures which people make without knowing it, and in spite of themselves.

The man who passes his hand over his face when talking, for example, usually wishes to evade the issue under discussion. If you ask him, "How did you get along with your boss?" and he rubs his face or passes his hands over his eyes, you can suspect he'd rather not tell you the truth.

Crushing a cigaret violently, or drawing a doodle with more force than usual, may mean concealed anger, though his words may be pleasant.

Banging the table or shouting for emphasis often reveals an

inward awareness that he is not talking logically or is losing the argument.

If he puts his hand on your arm and becomes confidential it may betray he lacks conviction in his ideas.

Up-and-down gestures that slice the air are likely to reveal that he is determined.

And if he rubs his nose, it may be due to dissatisfaction, not an itch. Itching itself may mean embarrassment or excitement. When the itching means embarrassment, it is still necessary to determine what causes the embarrassment.

There is a tendency, but by no means universal, for fear to cause the facial muscles to relax and the eyes to flicker while watching the feared object intently. In anger, the facial muscles become tense; the eyes flash and glare at the hated object. In sadness, muscles slump; there is little movement; the eyes almost close and look blankly at nothing. Yet often a real sadness is felt but hidden under a cloak of superficial gaiety.

Flashes of emotions may be shown by changes in skin color. Blushing usually goes with embarrassment—but not always. Loss of color usually goes with fear. Sweating without cause often means anxiety. There are many exceptions to these, however.

Interest may be shown by leaning forward, watching alertly, disinterest by moving or looking away. Again, you can't always trust these appearances.

Facial expressions can also be read, but are subject to more error. For one thing, people try to control their expressions, as any poker player knows. For another, there are no characteristic facial expressions, even when no acting is involved. Some people involuntarily show bitterness by curling their lips, but others "just as naturally" have the same expression in wonderment.

While facial expressions may be misleading, they are worth watching closely for clues which can be confirmed by other telltale observations. Changes in expression from moment to

moment should always be noticed. They will suggest whether the individual is warming up or cooling off, being frank or evasive, eager or bored at the moment. But they will not tell whether he is lying or telling the truth, whether he is a good mechanic or a poor one, bright or dull.

There is a widespread belief that the eyes are the "mirror of the soul" and tell much about one's character. Although eyes can be expressive, it is well established that the mouth is more expressive than the eyes. You will come closer to reading another's feelings by watching his mouth than his eyes. You will be closest if you observe his entire face, gestures, and voice inflections—and many other things as well.

The Patterned Interview

While the expert can detect many telltale signs in a ten-minute talk with a total stranger, there are not enough experts to do this for business. Therefore, many firms have tried to develop their own semiexperts who necessarily place more reliance on past history than on facial expressions. Their successful experience shows that most people who have average or better intelligence can learn to interpret many things that indicate the dollars-and-cents value of a personality for business.

Outstanding work has been done by Dr. Robert N. McMurry, who devised the Patterned Interview. Following this Patterned Interview guide, high school graduates can be trained to size up some of the characteristics which are important in business by asking questions which throw the spotlight on past behavior. These questions are preferably asked face to face, though written answers on an application blank can be used to an extent.

The Primary Mental and Engineering Abilities show what the man can do, but do not tell what he will do. The personal

history analysis, which was shown for service station attendants, indicates suitability for *a particular job.*

The Patterned Interview digs out the personality fitness for *any job.* This general fitness for any job requires some complex personality characteristics which are indicated by these questions:

1. Is he steady, with staying power?
2. Is he industrious, not needing to be pushed?
3. Does he get along well with others?
4. Is he likely to be loyal to the firm?
5. Is he ambitious and trying to improve?
6. Is he mature and free from youthful impulsiveness?
7. Does he have strong motives for working?

The Patterned Interview secures information bearing on general qualities better than direct questions would. If you ask, "Are you free from youthful impulsiveness?"—for the life of him the man couldn't tell you, or wouldn't give an honest answer if he thought it unfavorable. But the Patterned Interview plans the interview so as to elicit information about his previous jobs, schooling, family life, health habits, financial background and so on—thus making it possible for an informed person to draw a safe conclusion as to whether the person is mature or immature.

Most interviews are random. The Patterned Interview sets a pattern of significant topics which keep the sizing up in the right column. Here is how it works.

Which would you hire?

Try it yourself on these two young men reported by Dr. McMurry. They are being sized up for work as sales correspondents. This is rather routine office work requiring accuracy. Contact with customers is entirely by letter or telephone. A thorough knowledge of the products and their uses is needed.

Several girl clerks who file correspondence must be supervised. That is the job.

Now size up the two applicants. Both are high school

FAMILY BACKGROUND	DOMESTIC AND SOCIAL SITUATION	PRESENT FINANCIAL SITUATION
Age of Parents if living F____ M____	S___ M___ W___ D___ Sep.___	Own home?___ Value $___ STABILITY?
Dates of Parents' deaths F____ M____ NORMAL CHILDHOOD?	Date marriage____ 19___	Amt. mortgage $___ MOTIVATION?
GOOD EMOTIONAL ADJUSTMENT?	Children's ages____ DOES THIS PROVIDE MOTIVATION?	Rent paid $___ FRUGALITY?
Father's occupation____ Av. Earn. $___	No. other dependents____ MOTIVATION OR WORRY?	Board paid $___ STABILITY?
Brothers and Sisters No. older____ No. younger____ HAS HE BEEN BABIED?	How do you and your wife get along?____ IMMATURITY?	Live with relatives?____ IS IMMATURITY INDICATED?
How was time spent after school? Saturdays? Vacations?		Own furniture? Yes___ No___ IS STABILITY INDICATED?
HABITS OF INDUSTRY?	INSTABILITY?	Current debts $___ IS HE MATURE FINANCIALLY?
SELF-RELIANT?	Date(s) of other marriage (s)____ 19___	What for?____ Wages ever garnisheed?____ DOES THIS SHOW IMMATURITY?
Sources of spending money	Reasons for end of marriage (s)____ DO REASONS INDICATE INSTABILITY?	Reasons sued?____ IS IMMATURITY INDICATED?
AMBITIOUS?	OR INABILITY TO GET	Ever borrow money? $___ IS HE MATURE FINANCIALLY?
SELF-RELIANT? Did you help support family?____	ALONG WITH OTHERS? Active in luncheon clubs or civic groups?____ SOCIALLY WELL ADJUSTED?	What for?____ From whom?____ GOOD JUDGMENT?
WAS HE WILLING TO DO HIS SHARE?		Net worth $___ WILL THIS AFFECT MOTIVATION?
Age when first self-supporting____	DOES HE WORK WELL WITH OTHERS?	DOES HE PLAN?
HAS HE CARRIED HIMSELF?	Extent of drinking?____ SENSIBLE, OR POOR ADJUSTMENT?	Other income $___ per___ WILL THIS AFFECT MOTIVATION?
Boy Scouts, 4-H, and similar activities.	IS IT A HABIT? Types of people who "rub you the wrong way"?	Source____
		Wife employed? Yes___ No___ DOES HE DEPEND ON HER?
	GET ALONG WELL WITH OTHERS?	Her earnings $___ per___ EFFECT ON MOTIVATION?
GET ALONG WELL WITH OTHERS?	AFFECT WORK HERE?	Kind of work____
Offices held____ WAS LEADERSHIP INDICATED?	Arrests____ Charge____ IMMATURITY?	Life insur. $___ Other insur. $___ IS HE PROVIDENT?

A section of the Patterned Interview Guide Form. (Courtesy Dr. Robert N. McMurry, Copyright by Science Research Associates, Inc.)

graduates, their ages are the same, experience similar, and tests show they have the same general intelligence. Here is a summary of their life histories, and superficial personality characteristics:

RALPH A. is well dressed, has an affable manner; talks easily. In the few years he has worked he has had a wide experience in jobs; he says he changed jobs to gain experience. Between jobs he has taken long vacations during which he lived on unemployment compensation. His wife has a good job and has worked steadily since they were married. They do not want to have children, and live in a furnished apartment. They have some debts because they try to keep up with friends who are better off financially.

HOMER M. has an ordinary appearance and is not much of a talker. He began work as an office boy, and in ten years was a bureau head for the same firm. He is married and has three children. His wife is not employed. Their small house is nearly paid for, and they have no other debts. He has had little help from his parents; because of his father's poor health, Homer started work at fourteen. At present he helps support his parents, and has helped a younger brother through business school.

Picture those two men, and their families.

Ralph A. gives a better first impression. But before deciding which is the better man for the job, check through the following guide items from the Patterned Interview, to see how they stack up with respect to the seven questions in the preceding section on page 202. The quality to look for in these men is shown in parentheses after each of the following items.

Schooling

To what teams or clubs did you belong in school? (Does he get along with others?)

Were you elected to office in any of these? (Leadership qualities?)

Did you like most of your teachers? (Suspect people or get along with them?)

Were many teachers unfair to you? (Attitude of being picked on?)

How did you get spending money? (Learned to work, to respect money?)

Why did you quit school? (Necessary, or due to dullness, or trouble with others?)

Are you taking night or correspondence courses? (Satisfied, or trying to improve?)
What courses did you like best? (This shows interests, not general qualities.)

Family life

Did you have to work to help the family? (Early industry and maturity?)
How did you spend vacations and time after school? (Habits of work, responsibility?)
Were you the favorite child of the family? (Pampered, or jealousy started?)
Did you belong to Scouts or other groups? (Worthwhile groups? Get along well?)
What offices did you hold in these groups? (Leadership qualities?)
Do you spend much time now visiting your family? (Loyalty, or a lone wolf?)
How old were you when you supported yourself fully? (Babied, or learned to care for self?)

Present domestic and social situation

Member of what lodges and clubs? (Liking to be with people?)
Officer in any of them? (Leadership? Popularity?)
What do you do for recreation? (Demoralizing or helpful? Mature or immature?)
What races or religions do you dislike being with? (Prejudiced?)
What troubles with wife or sweetheart? (Indicate impulsive immaturity?)
Is your wife employed? (Will this make him less regular in work?)
How do you and your wife entertain others? (Socially well-adjusted?)
Where do you live? (Beyond means, or in undesirable surroundings?)

Financial situation

Do you own your own home? (Is this motive for working hard?)
How much support do you have to give others? (Motivating? Feel responsibilities?)
What mortgages or installments do you have? (Cause for worry? Impulsive spending?)

What insurance do you carry? (Figuring ahead? Attitude of responsibility?)
How much money did you save last year? (Provident?)
Have you had to borrow from small loan companies? (Grown-up in handling money?)

Occupational history

What kinds of work have you done? (Is he a job-rover?)
How much have you been unemployed in the past five years? (Satisfied with unemployment compensation?)
How did you land your last job? (Self-reliance and initiative?)
What did you dislike about your last job? (Is he a complainer?)
How much time did you lose from work, and why? (Dislike steady work?)
What did you do while out of work? (Invest time, or enjoy idleness?)
Did you like the workers on your last job? (Getting along with others?)
Was your boss always fair with you? (Dislike being bossed? Loyalty?)

When those patterned questions are applied to Ralph A. and Homer M., the first impressions they made are reversed. Homer M. is much more mature than Ralph A. and a better job risk. (For more information on emotional maturity, read Chapter 18 of our book *Practical Business Psychology.*) Business needs to dig into the past to find events which indicate personality.

Checking the clinical method

The Patterned Interview is an application of the clinical method to sizing up people. The clinical method uses established principles to estimate a person's assets and liabilities, much as the physician, who knows what to look for, sizes up one's general health. The usefulness of this method of sizing up of general personality fitness has been well proved. There have been cases, for instance, when, during labor shortages, people were

hired even though their personality showings were unfavorable. One large-scale example was in a plant of the Link-Belt Company, where interviewers had been trained to use a Patterned Interview. The applicants were classified as follows at the time of the interview:

	Number in each group
Outstanding prospect	72
A good one Fair or marginal	445
Should be rejected	40

All were hired, regardless of the classification. A month afterward 60 per cent of the "Should be rejected" group were out of their jobs, while only one "Outstanding prospect" had left.

A year and a half later another audit was made. At this time 406 of these people were still employed at Link-Belt. Their supervisors had not been told of the personality classifications. But when the foremen classified these remaining 406 into four groups, the following was discovered:

Foremen's report of success on job	Interviewer's classification			
	Reject	Marginal	Good	Outstanding
Outstanding		3	8	6
Above average	1	75	88	2
Below average	8	175	13	
Very poor	23	4		

That record shows a good agreement between the interviewers' forecasts and the actual job value as judged eighteen months later by performance. The significance of this prediction is increased when we consider:

That both men and women had been classified
That the classification was on general personality fitness, not on specific job abilities

That the classification was made by regular interviewers who had been given some training; it was not made by professional psychologists

That the employees were engaged in a variety of jobs

General personality fitness is obviously important in business. Reliable, agreeable workers are needed. Haphazard methods of sizing up general personality fitness have no more place in modern business than the quill pen. The topics outlined in the Patterned Interview should always be touched upon in an interview for the tale they tell about general personality fitness.

The largest part of an executive's time, even an engineering executive's, is spent handling and sizing up people. Sizing up the PTQ helps place the man on the job which best fits his particular personality make-up. Sizing up the items in the Patterned Interview tells whether he is fit for any job.

Some minor peculiarities to watch for

Jones employs a dozen people in his small business. It could be profitable, but he is always pressed for money because he can't pass up a bargain. The shelves of his establishment are filled with gee-gaws and gadgets he will never use. The back yard is filled with rusting equipment he bought "because it was a good buy."

Jones is a compulsive bargain hunter. His greatest thrill comes when he beats someone down on a price. A few venders have caught on to his burning desire to outsmart others, so they maneuver him into buying outmoded equipment and surplus supplies he will never use, which they are glad to get rid of at any price. Jones has fun haggling over prices; he calls the salesmen robbers, cheats, liars, and pretends to be insulted by them. When he is making a "deal," it sounds like the start of a street fight. And that is what it is for Jones.

He has a quirk which makes him want to be antagonistic to others. Instead of expressing this by vicious gossip, by domineering over his workers or getting drunk and starting a fight, Jones's hostility has become a compulsion to beat down prices. The useless stuff on his shelves does not represent any hoarding instinct; the gee-gaws are like a prize fighter's trophies of victory. Jones is smart enough to know his bargain-hunting is foolishness, but he is drawn to it in spite of his better judgment.

The silly things that people do despite knowing better generally go back to frustrations and mental burdens carried from early childhood. These irrational acts are due to frustrations that are related to one or more of these:

a. Feeling of guilt
b. Feeling of hostility
c. Feeling of inferiority
d. Feeling of being unloved and unwanted

There are several types—called compulsions, obsessions, tics, and phobias. They are closely related, and they appear in otherwise unpeculiar people.

Compulsions—"I didn't want to do it"

A compulsion is a pointless act that a person is impelled to do because of early thwartings. Compulsions are:

a. Repetitive actions—done over and over
b. Inappropriate actions
c. Wasteful actions
d. Actions a person cannot keep from doing
e. Actions a person would like to stop doing

A banker, who had a compulsion to tug a lock of his hair, tried wearing his hat in the office to stop it. But a few nights later, he could not sleep until he had walked back to the bank

to make certain the windows and doors were locked. Wearing his hat indoors squelched one unwelcome action, but it shifted the compulsion to checking windows. Worrying whether doors are locked or the gas turned off, or whether outgoing letters were stamped and sealed, are common compulsions. The worrier has no inner peace until he makes certain. And the next day he will go through the same compulsive routine over again.

Some persons wash their hands many times a day because they are afraid of dirt or contamination. Some wear gloves compulsively for the same reason. Counting pocket change several times a day is another frequent compulsion.

Systematic workers often are systematic because it is a compulsion. Work becomes a ritual with them. It has to be done in a certain sequence, always the same, and woe to the person who alters the arrangement.

Many fixed habits of the rigid personality approach compulsions. Doing things in the same repetitive way gives a feeling of security that the person lacked as a growing child.

Tidiness, accuracy, and thriftiness are often pocket-edition compulsions.

Giving gifts and doing good deeds for others also may become compulsions. They soothe an underlying feeling of guilt and selfishness.

Traveling is sometimes a compulsion. The person has an inner restlessness that makes him want to go places, any place. Some just ride the subway or bus lines. Others take longer trips on the spur of the moment. Executives sometimes have this travel compulsion, and suddenly announce they will make an "inspection trip" to surprise the boys in the field.

Counting the number of steps in every stairway, counting the letters in electric signs, putting dots inside the "o's" on a page, are some of the many little everyday compulsions.

When anything "just has to be done," and done over and

over, or in a certain rigid sequence, without serving any useful purpose, it is probably a compulsion. The person knows it is silly and pointless, but he feels he must do it.

Many minor compulsions are natural in children and should not be noticed. With adults, it is a different story.

Gambling, stealing, and fire setting

Habitual gambling is a compulsion, caused by feeling frustrated in love and affection. Although the slot-machine gambler knows the odds are against him, his frustrations compel him to keep putting in the coins. This repetitive feature, putting one coin in after another, dealing and redealing cards, rolling dice over and over, fits the compulsive need to repeat actions.

The fact that gambling usually is illegal also suits the compulsive person's nature to a T. He usually has a deep feeling of hostility and likes to flaunt regulations of all kinds. And losing fits his nature better than winning because the losses provide some punishment for his feeling of guilt. He feels guilty, not over the gambling, but over long-ago childhood experiences that linger in the deeper levels of the mind.

Kleptomania, or impulsive stealing, is another typical compulsion. Gambling is generally a man's compulsion, and kleptomania, a woman's. Christina, Queen of Sweden, was addicted to compulsive stealing, and had a guard to keep her from taking things that were not fastened down. She was frustrated by lack of affection from her parents. Impulsive stealing and gambling both have a large amount of affection-seeking in their unconscious motivation.

Thefts from department stores total about 75 million dollars a year. Most of this loss is due to professional shoplifters, but a sizable share goes to kleptomaniacs, like the woman who took only blue four-in-hand ties and had a trunk filled with them

when caught. Retail clerks need to watch the customer who is "just looking around," especially if the customer is handling many things. The customer who looks to see if she is being watched, rather than at the merchandise, should be kept in sight every moment. True kleptomaniacs, however, often take articles impulsively with no attempt to hide them.

Pyromania, the impulse to set fires, is another compulsion that belongs to this family. It often is found, interestingly enough, in volunteer firemen. The feeling of being unloved causes the emotional tension that makes some people become firebugs. A cleaning woman tried twelve times to burn down the New York hotel in which she was employed.

Nymphomania in women and *satyriasis* in men are excessive cravings to be loved. Marriage is not enough—they want the whole world to love them. This compulsion keeps the divorce rate high. Mary, Queen of Scots, Catherine the Great of Russia, and Anne Boleyn were some famous nymphomaniacs. Goethe, Lorenzo de' Medici, and Boswell, the biographer of Samuel Johnson, were victims of satyriasis. Flirting is often a mild form of this compulsion, which makes trouble for people who are old enough to know better.

Obsessions—"I can't get the idea out of my mind"

Obsessions are unwanted but persistent ideas that pop into mind, often when the person should be thinking about something else. They represent the thinking side of compulsions. The compulsion is action, the obsession is thinking. When the schoolboy tries to step on every crack in the sidewalk, that is a mild compulsion. When his sister is plagued with a tune running through her head all afternoon at the office, that is a mild obsession.

Obsessions are often substitutes for something the person

does not want to think about. They are substitutes for thoughts that conflict with ideals. They can be compared to the trick of talking rapidly about something else when you are afraid of giving away a secret.

A large share of *jealousy* is just an obsession. Often, there is no foundation for jealousy in married life, or between employees. Yet the feeling will develop as an obsession and cause as much harm as if it were justified. Obsessive jealousy results from the mental burden of feeling unloved and from an inner hostility toward the parent of the same sex.

Indecision is an obsessive condition, in which people lean on the boss or some other person for personal decisions so that they need not feel responsible for themselves. The man who gets drunk to pick a fight, so he can claim no responsibility, is a related case. So is the person who goes over his work two or three times, because he is obsessed by the idea that he has made mistakes.

Phobias—"I don't know what makes me afraid of it"

Phobias are recurring, unreasoned, unwarranted fears. They are widespread and have a strong influence on behavior. Joseph Stalin has a phobia of high places, and it is an ordeal for him to ride in an airplane. Mussolini had a phobia of closed places, and therefore had an office as big as a barn. Napoleon and Kaiser Wilhelm had a phobia of cats. Martin Luther had a phobia of thunder.

Joseph Pulitzer, newspaper founder, had a besetting dread of noise, which became so severe that he lived at sea on a yacht, had a soundproof room, and was set on edge by the noise of silverware at mealtime. Greta Garbo has a phobia of crowds. Sonja Henie has a phobia of blushing. John Bunyan had a phobia of women. Nikola Tesla had such a phobia of germs that he

would never shake hands. A New Jersey office manager has a dread of earthquakes; although he has never been in one, he turns pale at the sound of the word.

The possibility of phobias should be investigated when applicants are being interviewed for work in which certain phobias would be a handicap. Stalin would be poorly suited for work as a structural steelworker; John Bunyan could not have supervised women workers; Greta Garbo could not qualify to sell in a crowded department store.

People who have phobias usually admit them, or even brag about them. But the compulsions of gambling, kleptomania, and pyromania, the individual keeps carefully concealed.

Phobias and compulsions often go together. Fear of dirt or germs is usually the cause of compulsive hand washing. Compulsive doing-good is often associated with a phobia of sinning.

The average man has two phobias, women average three and a half.

Most phobias are caused by some early frightening experience, about which there was a feeling of guilt at the time. The experience seems to be forgotten, but is not; it merely cannot be recalled consciously. The feeling of guilt has caused the person to *repress* the experience beyond easy recall. It lingers on in the deeper mental levels, and causes continual expectation of coming punishment. Phobias cannot be cured by doing the thing that is dreaded. The inner conflict over temptations has to be removed first, to clear up the repression.

The story of a forty-year-old architect shows how phobias differ from what they seem to be on the surface. This man was so afraid of open spaces that he could not leave his house to cross the street. Crowds also made him panicky. Since he could not go out to work, he made a small living from odd jobs that other architects brought to his house.

Finally, he consulted a specialist who found that the phobia

of open spaces had started suddenly when the architect was sixteen. He had attended a medical lecture in which gory details were described, and he fainted. He was ashamed of such a sissy action as fainting, and imagined he must have a bad heart. The fear of open spaces was a substitute for his real fear of heart disease and the possibility that he might drop dead on the street in a crowd of strangers. Once he understood the repression that had started his phobia, it began to disappear. He got work in an office, and could attend crowded athletic contests and church services in perfect ease. The concealed significance of the phobia had to be discovered in order to drain off the nervous tension.

Tics—"I wish I'd quit drumming the table"

Tics are mannerisms or "nervous habits" that have become compulsive. The banker who pulled at a lock of his hair had a hair-tugging tic. Jingling keys, biting nails, smacking the lips when talking, may become so automatic that they are done without thinking and without being able to stop. When habits reach this stage, they are tics. Like other compulsive things, tics are evidence of inner tension.

Field Marshall Potemkin, who ruled the heart and head of Catherine the Great, was "the greatest nail-biter in Russia," Catherine said. Hitler had the tic of jerking his eyelids. Cicero's nose would twitch without him realizing it. Madame Milka Ternia, a noted dramatic soprano, had to retire from opera when she was forty, because of a nervous winking of her right eye. When she tried to stop it, the tic spread to become a twitching of the whole side of her face. A prominent attorney had to give up court appearances because he perpetually cleared his throat.

There are also *vocal tics,* meaningless phrases that people use over and over, such as "Do tell" or "Uh-huh." These vocal

tics are more noticeable over the telephone than in face-to-face speech.

Tics have most business significance in the case of individuals who have to meet the public. A top salesman, who acquired the habit spasm (another phrase for tics) of sniffing and snorting when he listened to other people talk, had to shift to clerical work.

Spasmodic jerking or twitching of muscles may be caused by a diseased condition in a nerve. More often the twitching is just a habit spasm due to some hidden emotional tension. When the tic is due to diseased nerves, it usually appears during sleep, while the emotionally caused tics virtually all disappear in sleep.

Don't try to stop them

These imperative thoughts, fears, and actions cannot be stopped just by resolving to stop them. That is wasted effort. They are due to pent-up emotional tensions, and trying to stop them only adds to the tension.

Make friends with them, don't try to fight them. Laugh at them, and recognize them for what they are—silly ideas and acts caused by emotional tension. If they interfere with your career, as in meeting the public, consult a specialist.

Keep them from becoming worse by taking it easy in crises. The emotional experiences of sickness, death, disappointment, or bad luck may add to inner tensions—but not if you have acquired the habit of taking it easy in emergencies. Fatigue also makes one's imperative thoughts and acts worse. Keep rested and in good physical condition.

Sometimes, a person thinks an obsession or phobia is a sign that he is losing his mind. It is no such sign. A compulsion may be annoying and silly, but it is not a symptom of insanity. These

silly acts and thoughts seldom grow worse than they are after the age of forty.

Some milder compulsions can be "cured" by deliberately giving in to them to excess. Here is an example of how it works. A schoolteacher who was pestered by the compulsion to count her steps, spent the first two days of an Easter vacation walking around the city, making herself count every step she took. For the first hour this was natural; the second hour she wanted to think of something else; by the third hour she had more than she wanted of step counting, but she kept at it for two days for good measure.

"I did so much step counting," she said, "that I haven't counted a step since."

Chapter nineteen

PRIMARY PERSONALITY TRAITS TO ESTIMATE

WHAT'S AHEAD

Types versus source traits
Clusters of personality traits
Twelve primary traits
Practice with the primary traits
A guide in job analysis
The make-up of personality

Types versus source traits

We are often tempted to group people into types—bullies, smoothies, the student type, the timid soul, the motherly type, and so on. Since we have many words that type people, it is natural to suppose there must be such types, but scientific work has shown that there are not.

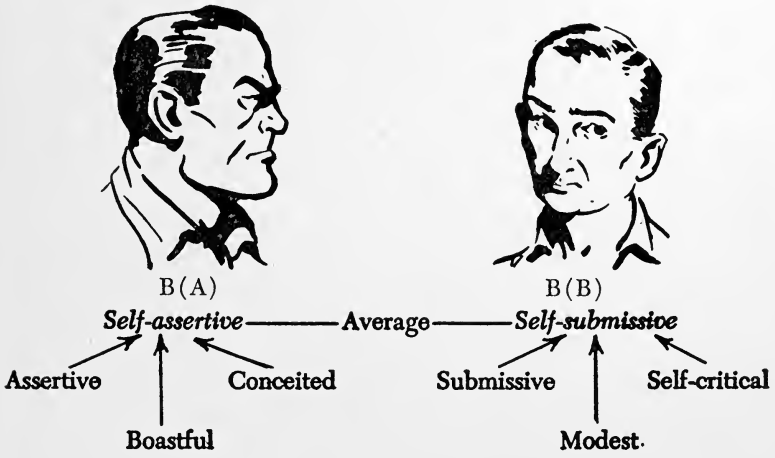
This confusion of words has misled the practical sizing up of personality. Cooperation, for instance, is a desirable quality, and most firms that rate their employees include this quality in the rating. But cooperation is not an elementary human characteristic; it is a complex result of many factors, depending upon the situation as well as the person. Oscar may cooperate with the boss he likes, but not with the neighbor he dislikes; he may cooperate when the boss asks him to help on a rush job, but not if he is told to play a trick on another worker.

Dr. Raymond B. Cattell, English-born research professor of psychology at the University of Illinois, has isolated what he calls the *source traits of personality* which make most books and theories of personality more obsolete than a roll-top desk.

In the big dictionary Dr. Cattell found more than 4,000 terms which described personality qualities. His early experiments reduced this maze of overlapping words to a mere 160 terms. At the same time he had to add 11 technical terms for psychological aspects of personality which the dictionary had overlooked. Common sense apparently not only knew many things that weren't so about personality, but also didn't know at least 11 that were so. The 160 terms left from the dictionary, combined with the 11 technical words, gave a total of 171 possibilities of elementary personality qualities.

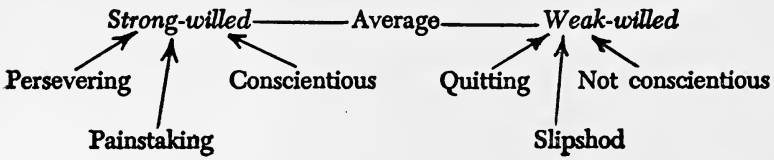
Clusters of personality traits

In the next step of the researches it was found that these 171 presumed elementary qualities were in fact grouped together in clusters in human nature. A total of 62 clusters was found.



An example of one of those clusters is shown on page 219. The extremes are shown; you will of course remember that most people are somewhere between the extremes.

Those clusters show that what we usually call conceit, for instance, is really a part of self-assertiveness. Boastfulness, assertiveness, and conceit turn out to be expressions of the same basic quality in human nature. Here is another cluster:



Look at the qualities which cluster together under strong-willed. A firm might decide around the conference table to size up applicants on (1) perseverance, (2) painstakingness, and (3) conscientiousness; but the cluster groupings show that those are, in actual people, pretty much the same thing. For practical purposes they are almost inseparable.

It might seem at first thought that self-submissiveness and weak will were much the same thing, but the clusters show they are related to very different qualities. Modesty, for example, is not involved in weak will, nor is quitting involved in self-submissiveness. The same facial expression might convey an impression of self-submissiveness or of weak will, but the make-up of the character is very different. For practical work we must know what elemental psychological qualities are behind expression and demeanor.

Twelve primary traits

The clusters were next reduced by factor analysis to a list of *12 source traits of personality.* (More may be segregated later, but we can be confident that these 12 actually exist in people.)

These 12 primary personality traits are combined in varying proportions to produce the core of personality as we size it up in others—and ourselves. In the following summary of the nature of each trait, only the two extreme ends are described. Most people, as you know by now, are somewhere along the line connecting the extremes. To help you picture each of these traits, 6 of the surface or superficial ways in which it is shown are also listed at each extreme. Study these 6 surface traits closely for each primary trait, since the terms used for the primary trait may be unfamiliar or even misleading because of past associations with them. Some famous people have also been named as examples of the extremes.

The first source trait is called "Participating – Withdrawn." It is given first because we are most certain of its existence and nature. Each person, of course, can be placed somewhere along a line connecting the two extremes. Benjamin Franklin and Franklin D. Roosevelt would fall toward the participating end, Franklin having a little more of this trait than did Roosevelt. Toward the withdrawn end we would find Woodrow Wilson and Stalin, with Stalin more withdrawn than Wilson. Study the following representation and try to place some people you know at the right place along the line.

1. Participating ↔ changing by degrees to ↔ **Withdrawn**

Adaptable		Inflexible
Good-natured		Cold
Trustful	(These are surface or	Cynical
Cooperative	superficial qualities.)	Obstructive
Friendly		Aloof
Optimistic		Pessimistic
Benjamin Franklin		J. P. Morgan
Thomas Edison		Josef Stalin
John Locke		René Descartes
John Wanamaker		
Franklin D. Roosevelt		Woodrow Wilson

The surface qualities help one to size up the underlying, fundamental personality trait. This source trait of Participating — Withdrawn may be partly inborn and partly the result of the person's reactions to environmental forces. Thomas Edison, for instance, was of a participating nature, but his deafness made him seem withdrawn. Size up half a dozen of your acquaintances on the Participating — Withdrawn trait. Go especially by the 6 pairs of surface qualities listed.

Now for the other source traits, try to become as familiar with them as you are with your own name.

2. Clearheaded	Dull
Thoughtful	Superficial
Conscientious	Slipshod
Quick-thinking	Confused
Wide interests	Narrow interests
Persevering	Quitting
Deliberate	Impulsive
Aristotle	Louis XVI
Madame Curie	Nero

This is not the same thing as general intelligence, or general mental ability. Clearheaded — Dull emphasizes character qualities. A ward politician or racketeer may have fair enough general intelligence, but be on the dull side in this primary personality trait. This source trait may be mostly inborn, and it has a wide influence on other personality qualities. The general manager should be near the clearheaded end; the day laborer who would rather be on unemployment relief is likely to be at the other extreme. Many transient workers and unemployables are at the dull end. Ralph A., from the preceding chapter, tended more toward the dull end than did Homer M.

3. Mature	Childish
Faces issues	Evasive
Self-controlled	Lacks self-control
Honest	Dishonest
Self-effacing	Show-off
Patient	Impatient
Self-respecting	Self-pitying
Herbert Hoover	Adolf Hitler
John Quincy Adams	Aaron Burr

Mature — Childish is an emotional factor in personality. Delinquents and neurotics tend toward the childish extreme: No. 489452 of our San Quentin story was at that end. Executives and administrators should be at the mature end of the scale, though not all of them are. Psychopathic personalities who lack a conscience are at the childish end. This source trait is believed to be due to inborn factors almost as much as it is to any character training.

4. Dominant	Submissive
Boastful	Modest
Conceited	Self-critical
Thankless	Grateful
Headstrong	Yielding
Hardhearted	Softhearted
Blames others	Self-effacing
Benito Mussolini	John Wanamaker
Alexander Hamilton	Ralph Waldo Emerson
Marshall Field	Katherine Cornell

The source trait of Dominant — Submissive may have an inborn basis, and may also be intensified in one direction or the other by such experiences as rivalry with brothers and sisters. Since people at the dominant end are forceful, some firms promote them to executive work—which is a mistake unless the

person has other primary traits which temper this one. People near the dominant end are not interested in work where they will be given tips. Aristotle noticed this difference in personality and wondered if there were two races of men, the servile and the aggressive.

5. Enthusiastic	Melancholic
Cheerful	Unhappy
Sociable	Aloof
Hearty	Quiet
Spendthrift	Thrifty
Changeable	Habit-bound
Optimistic	Pessimistic
Franklin D. Roosevelt	Abraham Lincoln
Oliver Wendell Holmes, Sr.	George III

Enthusiastic — Melancholic may vary in strength or direction from week to week in some people. Abraham Lincoln varied much, while George III varied to the point of insanity. This source trait is believed largely due to past experiences, especially to pressure from one's conscience or thwarted ambition at the melancholic extreme. Salesmen tend toward the enthusiastic extreme.

How would you size up some of your relatives on Enthusiastic — Melancholic? Remember to go by the surface qualities which show the source trait.

6. Sensitive	Poised
Tenderhearted	Hardhearted
Emotional	Unemotional
Dissatisfied	Satisfied
Tense	Relaxed
Idealistic	Cynical
Careless	Precise
Queen Christina	Henry Ford
Nathaniel Hawthorne	George Westinghouse
Stephen Foster	Chiang Kai-shek
Walter Winchell	General D. MacArthur

Repressions and emotional conflicts may play a part in this trait. The hard-boiled executive and cool airplane pilot are at the poised end; artists are at the other extreme. It is possible that further work will show this to be two source traits.

7. Socialized	Boorish
Thoughtful	Impulsive
Wide interests	Narrow interests
Good tastes	Coarse tastes
Cooperative	Obstructive
Strong-willed	Indolent
Painstaking	Slipshod
Winston Churchill	Samuel Johnson
Plato	Henry VIII

Socialized — Boorish does not involve etiquette. The meaning has to do with the kind of socialization that makes one shoulder responsibilities eagerly, as a citizen and neighbor. Ignorant trouble-makers who "hain't had no education and are proud of it," who are ignorant of their ignorance, are at the boorish end. This source trait is related to leadership by personal rather than financial power. Presumably, education of the right sort helps develop it. Note that some cluster-traits for strong-willed and weak-willed occur as surface signs of this source trait.

8. Independent	Dependent
Sticks to it	Quits
Loyal	Fickle
Reserved	Frivolous
Practical	Impractical
Hard-working	Distractible
Responsible	Irresponsible
Louis Pasteur	Ambrose Bierce
Harriet Beecher Stowe	Bret Harte

Independent — Dependent is a basic trait which is largely the result of early experiences and environmental influences. The independent end is where leaders should be. People who are

hysterical, or delinquents, are at the dependent end. Most children are at the right end and most adults should be at the left end, but many are not. As one grows up one should progress steadily toward the independent end, though some parents make this progress difficult.

9. Adventurous	Fearful
Frank	Secretive
Grateful	Thankless
Self-confident	Self-distrustful
Idealistic	Cynical
Friendly	Unfriendly
Carefree	Cautious
Thomas Edison	Hetty Green
John J. Astor	John Fitch
Andrew Carnegie	Spinoza

A person's tendency in this trait is partly inborn, partly acquired. Those at the adventurous end are ready to launch out; they work well with others. Those at the fearful extreme are better suited to working with things, or alone. This trait may be related to Participating – Withdrawn.

10. Fatigued	Vigorous
Meek	Assertive
Languid	Energetic
Absent-minded	Alert
Timid	Lusty
Self-distrustful	Self-confident
Relaxed	Tensed
Charles Darwin	Commodore Vanderbilt
Charlotte Brontë	Queen Elizabeth
Chopin	Peter the Great

The fatigue in the Fatigued – Vigorous does not refer to tiredness from hard work, but to the chronic fatigue of those who are apparently "born tired." This may be a constitutionally based

factor, related to the ductless glands. Or people at the fatigued end may be neurasthenics, and often show stubbornness. Those at the other end are suited for work that requires concentration and energy.

11. Excitable	Phlegmatic
Restless	Calm
Emotional	Unemotional
Impatient	Patient
Changeable	Consistent
Demanding	Self-contained
Boastful	Modest
Catherine the Great	Albert Einstein
Edgar Allen Poe	Calvin Coolidge
Daniel Webster	Henry Thoreau

Although Excitable — Phlegmatic seems to be largely inborn, some characteristic temperament that started in childhood may be included in it. This trait affects many other personality qualities.

12. Accepting	Suspecting
Cheerful	Unhappy
Friendly	Likes to get even
Trustful	Suspicious
Sentimental	Coldhearted
Grateful	Thankless
Enthusiastic	Sour
Andrew Carnegie	John Wilkes Booth
Queen Victoria	Mary, Queen of Scots
Dolly Madison	Jean Paul Marat

Accepting — Suspecting is closely related to Participating — Withdrawn. An individual who is near the suspecting end has been made that way largely by life's frustrations, and the habits he has picked up for meeting troubles. Those at the suspecting

end make a great deal of trouble and are difficult to get along with. Too much suspicion may become a mental disorder.

Practice with the primary traits

Use those 12 great source traits of personality as your first guide. The best way to do this is by trying to use them to size up people around you—family, associates, public figures, businessmen, even strangers overheard talking in public.

You would be wise to devote one week to each source trait. Memorize the 6 surface traits that are a sign of one source trait and size up as many people as you can on it for a week; then take up the second. As you observe how people vary, you will be making a yardstick by which you can make comparisons of others "on the run." A week devoted to this use of each source trait will make the use of them almost second nature.

To help you at the start, here is a summary of the list of source traits, with space allowed where you may write in the names, or initials, of people you judge to be examples toward one or the other extreme:

1. **Participating** — **Withdrawn**
   Examples: ....

2. **Clearheaded** — **Dull**
   Examples: ....

3. **Mature** — **Childish**
   Examples: ....

4. **Dominant** — **Submissive**
   Examples: ....

5. **Enthusiastic** — **Melancholic**
   Examples: ....

6. Sensitive — Poised
   Examples: ....

7. Socialized — Boorish
   Examples: ....

8. Independent — Dependent
   Examples: ....

9. Adventurous — Fearful
   Examples: ....

10. Fatigued — Vigorous
    Examples: ....

11. Excitable — Phlegmatic
    Examples: ....

12. Accepting — Suspecting
    Examples: ....

As you familiarize yourself with the core or source traits, you may wish to know the technical terms originally used by Dr. Cattell in describing them. They are:

1. Participating — Withdrawn
   Cyclothymia — schizothymia
2. Clearheaded — Dull
   Intelligence; general mental capacity — mental defect
3. Mature — Childish
   Emotionally mature stabilized character — demoralized general emotionality
4. Dominant — Submissive
   Non-euphoric hypomania — submissiveness
5. Enthusiastic — Melancholic
   Surgency — agitated melancholic desurgency

6. **Sensitive — Poised**
   Sensitive, anxious emotionality — rigid, tough poise
7. **Socialized — Boorish**
   Trained, socialized, cultured mind — Boorishness
8. **Independent — Dependent**
   Positive character integration — immature, dependent character
9. **Adventurous — Fearful**
   Charitable, adventurous cyclothymial — obstructive, withdrawn schizothymia
10. **Fatigued — Vigorous**
    Neurasthenia — vigorous obsessionally determined character
11. **Excitable — Phlegmatic**
    Hypersensitive, sthenic emotionality — phlegmatic frustration tolerance
12. **Accepting — Suspecting**
    Surgent cyclothymia — paranoia

A guide in job analysis

These 12 basic personality traits—or 24 when we consider that each has two extremes—are a basis for making job analyses in terms of human nature.

The following list gives examples of source trait extremes which could be tried in various occupations. Note that an extreme that is favorable for one occupation may be unfavorable for another. The same source trait needed for two jobs might be more valuable for one than for the other. The salesman, for instance, needs "Participating" more than the manager does. And within one occupation, one source trait will be more weighty than others—the tube-room cashier needs "Poised" more than she does "Socialized."

Salesman

Favorable	Unfavorable
1. Participating	Withdrawn
2. Clearheaded	Dull

3.	Mature	Childish
4.	Dominant	Submissive
5.	Enthusiastic	Melancholic
6.	?	?
7.	Socialized	Boorish
8.	Independent	Dependent
9.	Adventurous	Fearful
10.	Vigorous	Fatigued
11.	Excitable	Phlegmatic
12.	Accepting	Suspecting

Tube-room Cashier

	Favorable	Unfavorable
1.	Withdrawn	Participating
2.	Clearheaded	Dull
3.	Mature	Childish
4.	?	?
5.	Melancholic	Enthusiastic
6.	Poised	Sensitive
7.	?	Boorish
8.	Independent	Dependent
9.	Fearful	Adventurous
10.	?	Fatigued
11.	?	Phlegmatic
12.	?	Suspecting

Secretary (Woman)

	Favorable	Unfavorable
1.	Participating	Withdrawn
2.	Clearheaded	Dull
3.	?	Childish
4.	Submissive	Dominant
5.	Enthusiastic	Melancholic
6.	?	Sensitive
7.	Socialized	Boorish
8.	?	Dependent
9.	?	Fearful

10.	Vigorous	Fatigued
11.	?	Phlegmatic
12.	Accepting	Suspecting

Manager

	Favorable	Unfavorable
1.	Participating	Withdrawn
2.	Clearheaded	Dull
3.	Mature	Childish
4.	?	?
5.	Enthusiastic	Melancholic
6.	Poised	Sensitive
7.	Socialized	Boorish
8.	Independent	Dependent
9.	Adventurous	Fearful
10.	Vigorous	Fatigued
11.	?	Phlegmatic
12.	Accepting	Suspecting

The desired degree of each favorable or unfavorable trait will depend upon the nature of the occupation, not just the job title. The outside salesman, for example, should be expected to need more of the "Dominant" source trait than does the inside salesman. And the sales manager's secretary may need more of the "Adventurous" trait than the chief accountant's secretary. Remember, we look, not for the presence or absence of a quality, but for "how much" that needs to be invested in a particular job.

The make-up of personality

The vague thing people usually call personality is (a) pleasing little habits, or (b) idealistic virtues. Personality, when actually inventoried by means of the source traits, is something very different. It is not so much the way the person looks *to* the world as the way he looks *at* the world. Andrew Carnegie looked *at* the world participating, clearheaded, mature, dominant, en-

thusiastic, socialized, independent, adventurous, accepting. Hilter looked at the world a bit withdrawn, somewhat childish, melancholic at spells, and suspecting.

We all have all of these source traits, but we lean toward different extremes. Some traits also vary in the same person, depending upon the changing situations he has to meet and how he meets them. For example, some meet difficulties by becoming more withdrawn, others by becoming more adventurous.

Much confusion in everyday sizing up of personality arises from the fact that one and the same surface trait may be the expression of different source traits. For instance:

Cynicism may be a surface sign of the withdrawn, the poised, or the fearful
Slipshod work may be a surface sign of the dull or the boorish extremes
Cheerfulness may be a surface expression of the accepting or enthusiastic extremes
Cooperation may be an expression of participating or socialized source traits
Self-confidence may express the vigorous or the adventurous ends

We may estimate that Teddy Roosevelt's self-confidence came from the "Vigorous" source trait which he deliberately cultivated, while the self-confidence of the small-town loafer is an expression of the "Adventurous" source trait. Choosing a worker just because of his self-confidence might give you, not a Teddy Roosevelt, but the town loafer, if you didn't look beneath the surface.

Consider patience, as another example. Abraham Lincoln could be judged patient because of his "Phlegmatic" source trait, Winston Churchill because of the "Socialized" source trait.

Friendliness may be due to the source traits of "Accepting," "Adventurous," or "participating."

On the surface such qualities may seem similar, but basically

they indicate different traits. *Always look beneath the surface* for the source traits. If you don't, you are purely a speculative operator in sizing up people.

Once you know the source trait which the surface quality expresses, then you can safely guess many other qualities which cluster around it. When a person's optimism, for instance, is an expression of the "Enthusiastic" source trait, you can also expect him to be changeable and a spendthrift. But if the optimism is due to his "Participating" nature, then you will not need to keep such a close watch on his expense accounts, nor expect his changeableness to take him off on wild-goose chases so often.

Progressive summary of BASIC QUALITIES to size up

IQ Intelligence

Special sensory abilities
Special muscular abilities

PMA Primary Mental Abilities

Perceptual speed
Number ability
Word fluency
Word versatility
Word-meaning ability
Space ability
Memory factor
Reasoning
  practical
  deductive
  syllogistic
  in reading
Idea fluency

PEA Primary Engineering Abilities

Reasoning abilities
Visualizing single-plane space
Visualizing moving space
Visualizing reversed space
Memory for details
Quick memory for fine details
Muscular imagery
Perceptual speed
Perceptual flexibility

Interest Groupings

Commercial
Legal
Athletic
Academic
People and things
Biological
Physical sciences
Art

PTQ Primary Temperamental Qualities

Social introversion
Thinking extraversion
Depression
Cycloid
Rhathymia
General activity
Ascendance
Masculinity
Inferiority
Nervousness
Objectivity
Agreeableness
Cooperativeness

PPT Primary Personality Traits

Participating—Withdrawn
Clearheaded — Dull
Mature — Childish
Dominant — Submissive
Enthusiastic — Melancholic
Sensitive — Poised
Socialized — Boorish
Independent — Dependent
Adventurous — Fearful
Fatigued — Vigorous
Excitable — Phlegmatic
Accepting — Suspecting

Glandular status
Job Patterns
Trustworthiness

Chapter twenty

MAKING BETTER USE OF ABILITIES IN A BUSINESS

WHAT'S AHEAD

The anatomy of a business
Displaced persons and hidden abilities
Analysis of the XYZ Company
Reorganization of the XYZ Company
How the job was tailored for Smithburg
There is no "One Best Job"

The anatomy of a business

Modern business, with its many specialized jobs, demands planned organization; otherwise it would be like the man who jumped on his horse and ran off in all directions. There are specialized functions—purchasing, shipping, receiving, sales accounting, payroll preparation, production control, engineering, employee selection, and many others—each of which requires special training and often special ability. These jobs should be organized in relation to each other so that the pull is together, not at odds.

This breaking down of a complex business into departments is based on framework, or anatomy, which is pictured by an "organization chart." The organization chart shows who does what, and the executives or department heads adhere closely to

this anatomy. Memos, orders, requests, ideas, pass up and down the line as charted, although they are sometimes unduly delayed before reaching the department for which they were intended. Promotions, also, are sometimes held to the lines of the organization chart. A firm with a too rigid organization may have many displaced persons, especially in the in-between ranks, and the belief then spreads that "a good man hasn't a chance in this company."

Consulting management engineers—specialists in curing sick businesses—report that about three-fourths of the problems brought to them are due to shortcomings in the way businesses are organized.

Displaced persons and hidden abilities

The organization of many firms—especially small ones—too often resembles a skein of yarn after the kitten has played with it. Often, a self-made practical man at the head tends to organize everything around himself, with no clear-cut delegation of jobs and responsibilities.

When a firm has "just grown," without careful planning for separate functions and the placement of key workers by abilities, it has many displaced persons and much hidden ability in its ranks. The XYZ Company in Chicago was typical of this. It was a new industry, and the company "just grew" as the industry grew. In 1939 it was sold to new owners who considered it a a going concern and made no changes in the organization of 600 employees. Since the business continued to grow, the new owners took their profits at the end of each year and let well enough alone.

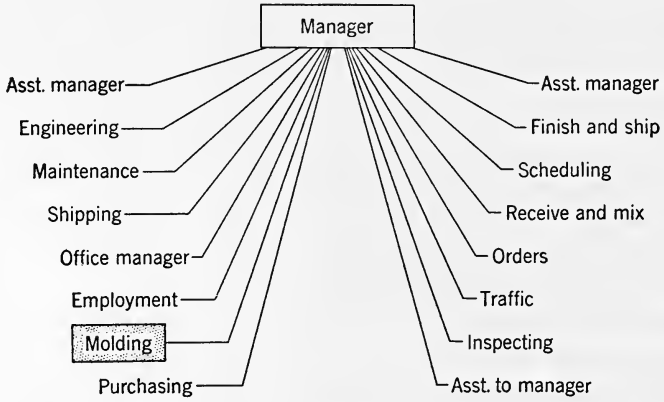
Seven years later a bank loan was sought to cover costs of expansion, but the firm was found to be in shaky condition and the banks would have nothing to do with it. This loan refusal made

the owners sit up and take notice. They asked Dr. L. Rene Gaiennie, who later became director of personnel for Fairbanks, Morse & Company, to hunt for weak spots in the managing personnel.

Dr. Gaiennie discovered that the plant had no planned organization. The self-made manager had each department head report directly to him, just as was done when the firm had a few dozen employees. As shown in the chart, there were 16 department heads with whom he checked daily. This kept the

OLD ORGANIZATION

Sun-ray, or Whirligig Style



manager so occupied with details he should have delegated that he was busier than the proverbial one-armed paper hanger in fly season. The pressure of hour-to-hour crises and decisions not only kept him fatigued, but also prevented him from doing constructive planning. He did not really manage; he "shot trouble" all day long.

It is generally accepted that an executive should not try to supervise directly the work of more than 7 subordinate executives. Even that is too much in many cases. A firm may have 21 departments, but the chief executive can best control the

21 by planning the organization so that he works through no more than 7 individuals.

The manager of the XYZ Company, had a double dose, with 16 heads reporting directly to him. Furthermore, he had failed to delegate and organize the work. He made a merry-go-round for himself—not a business.

Since the organization was made on a catch-as-catch-can basis, many functions had been assigned to department heads on the spur of the moment. When need arose, the nearest supervisor was often given a job without careful sizing up of his capacities for the added work. This complicated the supervisory jobs, caused overlapping responsibilities, and touched off jealousies between department heads. It also produced some fifth wheels which hampered teamwork.

Such a condition is typical of many firms in which the man who started on a small scale still tries to keep his finger in everything, even after the firm has grown to big business. Some 95 per cent of the businesses of the country have less than 100 employees, and in most of these the proprietor carries the organization around inside his hat, neither planned nor charted.

Analysis of the XYZ Company

Dr. Gaiennie's basic approach to put the XYZ business back on its feet was a plan of organization, with definite functions for each department head. The problem was to develop an efficient and relatively permanent, yet flexible, organization. After this basic framework was planned, adjustments could be made in both jobs and people.

The firm's key personnel and their jobs were sized up in detail. Then a trial balance was struck between the two columns. This showed that personnel and their jobs were far out of balance. The job evaluations averaged several points higher

than the individuals who were trying to fill them. This balance sheet is shown for the first 6 key employees in the following tabulation:

How key men matched their jobs (Old organization)

	His evaluation	His job required	In favor of job	In favor of employee
Brown	498	604	106	
Jonesfield	447	501	54	
Greene	364	450	86	
Doe	351	338		13
Greying	246	279	33	
Smithburg	224	381	157	

The higher the number, the more capable the employee. And the higher the number for the job, the greater the requirements. Smithburg is in italics, because we are going to follow through and see what happened to him. He is also shown in the emphasized portion on both charts.

Of the 16 key employees, only 3 had "more than the job required," like Doe in the above tabulation. With the other 13, their jobs were beyond their abilities and had, in addition, been made unduly complex by the hit-and-miss assignment of duties.

That accounting might have been discouraging. Some directors impulsively advocated a wholesale house cleaning. But more sober consideration reminded them that each key man had priceless technical information and know-how. They were all loyal and hard-working—too hard-worked, in fact.

This personnel audit also showed that many key men had special abilities which were of no use in their existing jobs, but which would be useful to the firm if related tasks were grouped together to fit these abilities. Most companies have a wealth of such hidden abilities, which can be used if jobs are planned for them.

Reorganization of the XYZ Company

A new organization was worked out for the XYZ Company, as shown in the chart. Only 7 department heads reported directly to the manager under the new setup. Planning the key jobs and grouping task functions with a consideration for individual differences in abilities, made it possible to fit each key man into a position which closely matched his individuality. There was a 15 per cent over-all pay increase at no cost to the company, resulting from the immediately increased efficiency of operation.

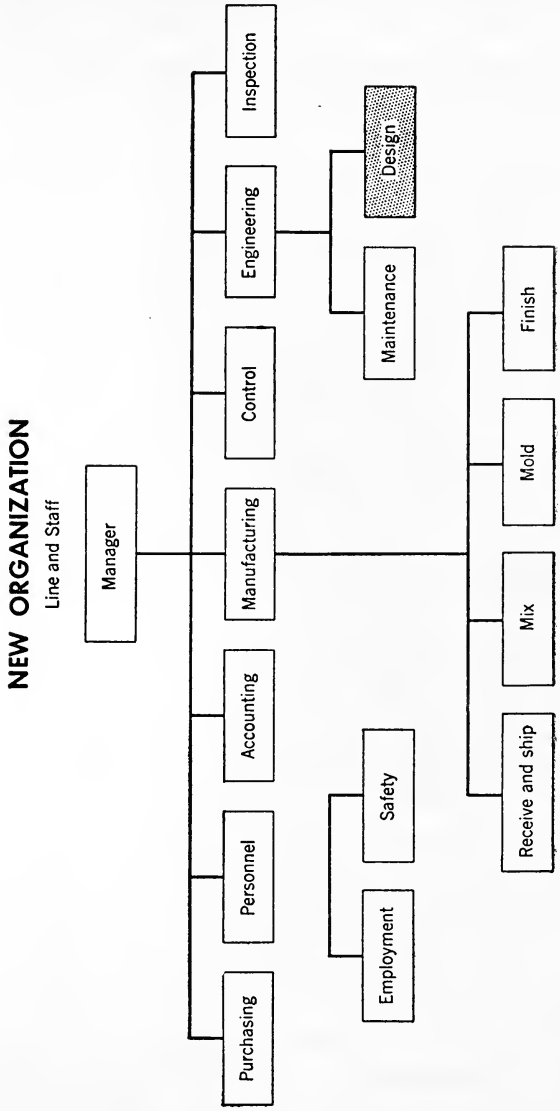
Here is the balance sheet between key personnel and their jobs under the new organization:

How key men matched their jobs (New organization)

	His evaluation	His new job required	In favor of job	In favor of employee
Brown	498	477		21
Jonesfield	447	469	22	
Greene	364	378	14	
Doe	351	348		3
Greying	246	250	5	
Smithburg	224	220		4

The evaluation points for each man are, of course, the same as before organization. Their abilities and capacities were unchanged. But the abilities required for their jobs had been changed so they came closer to fitting the men. Six of the 16 key employees now had "more than the job required." The remaining 10 averaged only 8½ points behind the requirements of the new jobs, whereas before the reorganization 13 men had averaged 63 points behind their jobs!

Let's see how this worked with Smithburg.


NEW ORGANIZATION
Line and Staff
Manager
Purchasing
Personnel
Accounting
Manufacturing
Control
Engineering
Inspection
Employment
Safety
Receive and ship
Mix
Mold
Finish
Maintenance
Design

How the job was tailored for Smithburg

Under the old organization Smithburg was 157 points behind the requirements for his job as superintendent of molding. His new job was that of design engineer, and he was 4 points ahead. The firm was at last receiving some value from special abilities which had been smothered previously.

Smithburg was a quiet man, fifty-six years old, a graduate engineer. He was happily married to an energetic and ambitious wife. Smithburg excelled 90 per cent of the population in:

Mathematical and logical ability
Practical mechanical comprehension
Job knowledge and technical interest

But he had his weak points, as we all do. His verbal abilities were low—he was poor at expressing himself and giving clear orders. Anyway, he preferred to think rather than talk. He was easily flustered in social situations. He carefully avoided occasions where there might be an argument or trouble.

A small group of ambitious young workers idealized Smithburg, and followed study plans he had worked out for their development. But most of the rough-and-ready workers in his department took advantage of his lack of self-assurance and ran over him.

His self-assurance had received a setback during the depression when he was forced to take work as a day laborer. His wife and teen-age daughters had felt humiliated, and had not quite forgiven him for his bad luck. His failure to manage the workers operated to keep his self-assurance lower than his real abilities warranted.

As superintendent of molding, Smithburg had been required to handle people. He had been promoted to this work largely

because he knew the most about molding; the manager neglected to size him up on handling people. Smithburg would have preferred to tinker and experiment, though his wife and daughters enjoyed basking in his title of superintendent. Union stewards practically ran his department while he fooled with machinery and meekly took the blame when things went wrong.

In the new organization he was design engineer. In this position he planned, created, and developed to his heart's content, and to the profit of the business. He worked with blueprints and machines, not with hard-to-handle molders. He could at last use his mechanical and logical ability for the benefit of his employer. Smithburg had an important job, but it was not loaded with the need for dealing with large numbers of people. His self-assurance rose.

Similar gains from the better use of their original human resources soon had the company in a position where bankers were willing to make a loan.

The organization of a business involves the effective use of individual differences. A business needs a plan, but it is people that make the plan work—not supermen, but the men and women at hand. The personnel may be O.K.; look for weakness in the way their work and relationships are organized.

A haphazard organization, or one planned on idealistic lines without regard for the human element, makes incomplete use of human talents. A periodic audit of jobs in relation to personnel enables a firm to keep its organization in line with its personnel. Job patterns can usually be tailored to fit the man. It is difficult to tailor human abilities.

One of the best organizations in the world is that of the American Telephone and Telegraph Company. Walter S. Gifford, who worked up from clerk to board chairman, and who is largely responsible for its "anatomy," gave his executives this philosophy of organization: "You can never escape from the human side

of the business and the fact that you are dealing not with machines but with human beings. So that even after you have organized your job and laid out the theoretical organization which can best accomplish it, you will almost always find it necessary to make variations from this theoretically sound organization to meet the peculiarities and temperaments of the people who are to carry on the work. It is always a good plan to have the ideal in mind and to work toward it; but by all means do not try to crowd human beings into a theoretical scheme when they do not fit."

There is no "One Best Job"

Everyone is familiar with instances of people who struggle along uncertainly in one job but become enthusiastic successes in another type of work. However, such instances do not mean there is one best job for each of us, and only one best job. A dissatisfied few spend their lives in hopeless quests for a job that will fit them like a glove. That job seldom exists. We have to be content with a little less than a perfect fit.

Most of us have assorted talents which qualify us to make good in a dozen or so jobs, not just one. On the other hand, there are also a dozen or more jobs for which most of us lack some of the primary abilities in sufficient quantities. The confident person keeps his mind on the dozen jobs in which he might make good, while the hesitant person thinks too much of possible failure.

The attitude with which one approaches a job is a part of the aptitude for the job. The wise employment interviewer plants in the minds of the applicants he selects the idea that they can make good. Training instructors and supervisors, too, should handle new workers so they have the optimistic confidence to use

the talents they have. The individual himself should start each job, not with a know-it-all attitude, but with a confident determination that he can do it and like it. Time may show he is wrong, but he will come closer to making good if he thinks he can. The experience will be useful, even if he doesn't make good.

It was Fechner's experience in physics that enabled him to originate the first psychological measurements. Thurstone's training in engineering mathematics gave him the background for inventing the factor analysis methods. Locke's study as a physician gave valuable background for his pioneering in the association of ideas. Their previous training as businessmen helped Robert Sherwood, one-time paint manufacturer, and André Maurois, one-time woolen manufacturer, make more profits from their second careers as writers. One does not fail on a job as long as one learns something that will be helpful later.

Between thirty and forty years of age many people become dissatisfied with their work, although they may be successful by all ordinary standards. During this decade people are likely to try out some of their unused talents cautiously, and perhaps make major changes in their careers. That was when I gave up college teaching to try business research, then writing.

B. F. Goodrich was a thirty-year-old physician when he gave up medicine to start the rubber company bearing his name. George Matthew Adams was an advertising writer when at thirty he started his own business, and for more than a half century his syndicate supplied features to newspapers all over the world. "I believe if a person is uncertain of himself, the best cure is to take anything at hand and start stepping," he told us, "and I like the idea of stepping forward rather than backward."

Albert W. Hughes was a teacher of Latin, who changed at thirty to become a clerk in a store; from clerk he steadily rose

until he became president of the J. C. Penney store chain. Mohammed was a merchant who changed his career at forty, and founded a religion which now has more than 200 million followers. Joseph Priestly was a minister who left that calling at forty to become a chemist and discover carbon dioxide. Nathan Read quit being a druggist at thirty-seven to invent the first workable machine for making nails, the caterpillar tread, and other inventions; at forty-eight he switched again, to become a county judge. All these were successful in their first occupations, and in their subsequent occupations as well.

Talents are not the fatalistic qualities sometimes imagined. We are not born destined for one narrow pursuit—nor are we born Jack-of-all-trades. What we are born with matters a great deal, but how we use the prizes we won in the lottery of birth is also important.

The chances are that the individual has many half-used abilities and talents for a dozen kinds of work. He can change these abilities a little; jobs can be altered still more to fit his talents. He may be the "One Best Man" for a particular job in his firm, but he may be held by rigid organization to a job which is only half-a-job for him, or for which he is only half-a-man.

One of the largest manufacturers of mechanical refrigerators recently engaged a firm of consulting personnel psychologists to locate the best man in the country to succeed their president. After nearly a year's search in which more than a hundred possible new presidents were sized up, the consultants settled on one man who was unanimously accepted by the directors. But the directors did not know until later that this new president had been one of their own employees ten years before. He had been a displaced person ten years before, and had moved out in order to move ahead.

Like individuals, many firms have unused abilities.

A continual sizing-up of individuals, and their jobs, has become an essential personnel function in many larger firms. Periodic personnel audits, or reviews, are made for every employee once or twice a year. Promising younger employees are thus saved from blind alleys, and in addition the company has its own supply of replacements for older executives.

Although more and more are sizing up on the basis of the primary qualities which get closer to the bedrock of real human nature, some of these periodic personnel reviews unfortunately still try to evaluate characteristics which exist in the dictionary, but not in people. One company still has to rate all employees on "mutuality," which the elderly board chairman insists is the most important characteristic for business; no one seems to know just what "mutuality" is, but so long as the chairman lives, it is a must.

Chapter twenty-one

WHEN TESTS ARE USED

WHAT'S AHEAD

Mis-estimates of abilities
The Boston experiment that made history
How tests were made for accountants
Taking, giving, and interpreting tests
How widely tests are used, and why
How the Radio Corporation of America uses tests

Mis-estimates of abilities

Much well-meant vocational advice is just a poor guess, and it is often fortunate that the advice is not followed. For example:

"No use wasting your mother's money or my time; you haven't any voice at all," was the advice given to the great tenor, Enrico Caruso, by a teacher who was trying to make him sing bass.

"You can never learn perspective and might as well give up art," Turner's teacher advised. Turner became not only a famous landscape painter but a professor of perspective.

"We cannot accept you as a student for you lack musical ability," was the verdict of the Milan Conservatory of Music about Verdi.

"I wish you would quit your foolishness," Bishop Wright told his sons, Wilbur and Orville. "If anybody does invent a flying machine it will not be you."

"You do not have the brains to learn surveying; better stick

to raising garden vegetables," his father told Arthur E. Morgan, who was to become a top reclamation engineer and builder of giant hydroelectric plants.

"The other boys are all right, but Henry worries me," William Ford said when Henry was twenty. "I don't know what will become of him." And you probably never heard of Henry Ford's brothers until you read this.

Businessmen make just as poor guesses as parents and teachers. "You'll never make anything of yourself in the hotel business; you don't have the knack for it," Cesar Ritz's employer prophesied. He would have been flabbergasted to know that the name Ritz was to become synonymous with luxury hotel living.

The persons who give advice so wide of the mark do not know what to look for when they analyze an individual's possibilities. Many employment interviewers are not much better equipped, and their mis-estimates cause avoidable labor turnover, low production, inaccuracies, accidents, and job grumbling. At least 10 per cent of the national payroll is wasted by poor placement. How many hopes are blasted cannot be estimated.

The Boston experiment that made history

Trolley accidents were costing the Boston street railways too much, so a committee of directors decided to do something to reduce them. They made the obvious conclusion that it might help if motormen would not run over pedestrians or delivery carts. Some members of the committee thought it would be a good idea to set up some gadgets that resembled trolley levers and control handles, and then see how well a motorman could use them while he watched a motion picture of traffic coming toward him.

The committee consulted Dr. Hugo Münsterberg, a Harvard psychologist. Münsterberg's psychological insight made him

reject the *minature occupation test* the directors were considering. His blunt dismissal of this proposition puzzled the committee, but years later his quick judgment was vindicated, for minature occupation tests have been found to be the least trustworthy of all vocational selection tests.

"Gentlemens," Münsterberg told them in his thick accent, "better we measure by basic capacities, not by imitation job." His introspective analysis made him conclude that a safe motorman needed:

A wide range of attention, to notice several things at the same time
A quick decision time to decide instantly what to do in an emergency
A quick muscular reaction time so that he could do it at once

Münsterberg devised tests, somewhat similar to Galton's, to measure range of attention, decision time, and reaction time. These tests were used to select replacement motormen, and to disqualify a few old-timers.

This pioneer work in vocational testing, which is amateurish by present standards, was described in 1913 in Münsterberg's book *Psychology and Industrial Efficiency*. This was a landmark in the application of psychology and ushered in the modern era of vocational testing. Applied psychology has come a long way since that introspective analysis of the qualities that might make a good motorman. "What a job takes" need no longer be guessed in terms of superficial qualities.

How tests were made for accountants

Ability tests are developed by experimenting with various possible tests to find the few that actually measure what is wanted. The tests themselves have to be tested, question by question and problem by problem, before they can be used. They are not cooked up around a conference table.

The American Institute of Accountants engaged test experts to devise tests for ability to become an accountant and spent five years, and some $50,000 to develop trustworthy ones. The experts tried out possible items for the accountants' tests on some 2,000 Certified Public Accountants in the United States and Canada. The items on which these proved accountants did better than people in other professions could be suspected of being diagnostic of the special mental abilities needed by a successful accountant.

The laborious "proving in" of every last detail in the tests is called *validating*. A test of vocabulary and ability to read business materials, and another on business arithmetic, were proved in as having a great deal to do with ability as an accountant. They were further proved in by trying them on students in accounting schools, to find whether students who made good grades had higher scores than students who had trouble with accounting. Some 70,000 accounting students were given the various possible tests before the statistics showed the experts that they could at last be sure which tests did measure ability for accounting. This statistical work on the tests was a mammoth accounting job in itself.

If a person takes one of these tests a second time, will he remember some of the questions and make a misleadingly high score? Some crafty people have thought so, and have taken tests under fictitious names to get that practice. But, for the more important vocations, several *alternate forms* of tests are standardized, which can be used interchangeably so that final scores are not affected by tricksters.

Practice effects are often eliminated from tests by including only items in which most people have had about equal practice. Threading a needle might be a good test of job performance, but it is not a fair test of natural ability, since some people have had more practice threading needles than others. Some-

times the first portions of the test are made purely practice, and are not scored. This equalizes any unfairness between a person who has taken many similar tests and is "test wise," and others who have never tried a test before.

There are dozens of little differences in the things which interest people from various vocations. Most chemists, for instance, like to work puzzles, while most lawyers are interested in reading history. These interests can give an indication of a "natural bent" toward one kind of work. These clusters of interests are closely related to personality, and give an indirect measure of it.

When the interests of successful accountants were sized up and tabulated, it was found that they fell into a pattern that was distinct from most other occupations. The accountants' interests were very different from those of the psychologist, for instance, but somewhat similar to those of production manager, purchasing agent, banker, president, and personnel manager. A special scoring for interests was developed to size up how well each manifestation of personality qualified one for work as accountant.

This account is typical of the way modern vocational tests are made. Other professional groups have sponsored the development of special tests—physicians, dentists, nurses, pharmacists. Such tests, as those now available for accountants, can be used by schools and companies from coast to coast. Scores will be comparable wherever the test is taken, since the tests are standardized. The scores definitely mean something and should be taken seriously, since they have been validated against success and failure in the profession.

Taking, giving, and interpreting tests

Taking tests is very simple, after the first nervousness wears off the practice exercises. The average time required is from 30

to 90 minutes. For some tests it is not even necessary to be able to read or write. Tests with no reading or writing are called *performance tests;* directions are either obvious or are given in pantomine. Performance tests are used more widely than might be expected, and not solely to test foreign-born people. They are useful with the 5 per cent of people who cannot write, with the deaf, and with young children.

Giving the tests also seems simple, but requires special training in most instances. In many firms, tests are given by a college graduate who is not a professional psychologist, but under the direction of a full- or part-time psychologist.

Explaining, and knowing, what a test score means is more difficult. Interpreting a score requires sound psychological training. For simple occupations, such as soldering ends of wire, the score can be evaluated against a critical or cut-off score, which shows the point below which a person is disqualified beyond doubt. For the more complicated occupations, and for the professions, a specially trained vocational psychologist should evaluate the scores; at least a master's degree in vocational psychology is essential for this.

Least simple of all is the construction and validation of tests. This is tedious technical work, beset with pitfalls. It is a job for only those with a doctor's degree in psychology. The tests for accountants, for example, were devised under the direction of Dr. Ben D. Wood and Dr. Arthur E. Traxler—with the cooperation of 1,300 firms of accountants and 140 schools and colleges over a 5-year period. That should discourage you from calling a conference some rainy afternoon to concoct a new and original test!

Starting a test from scratch is expensive in dollars, but a valid test quickly earns more than its cost. A test that is not valid earns nothing but a false feeling of confidence.

How widely tests are used, and why

Some 60 million psychological tests are given each year, to about 20 million people. The number is increasing steadily. About half the tests are used in schools, about 20 per cent in clinics and hospitals, and about 10 per cent by individual counselors. The remaining 20 per cent are used in business and industry.

More than half the firms that employ 1,000 or more workers use tests to help size up prospective workers and to promote older workers. The tests are given to applicants before the detailed employment interview so that the interviewer will have the test standings to guide him in the interview and to help in his decision. In business the tests are often called personnel tests, or vocational tests, or placement tests, to avoid any fears applicants might have about being "psyched."

Is this testing expensive? Dr. William James Giese reports that a firm having 2,000 applicants a year can begin to use psychological tests for a total cost of about $10,000 the first year, and less than $7,000 for successive years. This includes the fee for a competent consulting psychologist to engineer the work; the actual test administration and interpretation could be done by one with a master's degree.

This expenditure would result in a saving, over and above the test costs, of at least $1,000 a month. The saving comes from reduced turnover, quicker job learning, and better production on the job. Other gains, such as morale improvement because people are in work they like better, and reduction in accidents would be in addition to this $1,000 a month.

Tests help to attract a high type of applicants. Dr. Eleroy L. Stromberg, in making test installations for the consulting firm of Stevenson, Jordan & Harrison, Inc., in three plants of the

same industry, discovered that after a few months, applicants were better qualified than the original groups of employees tested. This was found to be due to the grapevine. Word got around in the cities where the plants were located that "You have to take a test to get a job there." This frightened away the less capable and resulted in raising the level of applicants.

Some 4 million employees in the United States each year are placed with the aid of tests. At a conservative estimate, there is a saving of at least $100 per employee who has been sized up by the aid of tests. That is a considerable total.

But tests are not popular everywhere. In 1936 the central committee of the Communist Party issued a proclamation abolishing psychological tests. Well, they say King Canute tried to order the tide to stop coming in.

How the Radio Corporation of America uses tests

The way RCA Victor uses tests will show some of the possibilities, and also give suggestions for avoiding pitfalls.

Daniel J. Bolanovich, an associate of the American Psychological Association, has been in charge of the RCA Victor work since 1943, with headquarters in the Camden, New Jersey, plant. The test work started cautiously in one plant, partly to prove-in the tests, partly to win the cooperation of those supervisors who may have doubted the usefulness of tests in sizing up ability. With the success of this trial run apparent after a year, the work was gradually extended to seven plants. The psychological testing in all plants is coordinated through the Camden personnel office.

About 12,000 applicants a year are tested, and a few old employees are tested when promotions are under consideration. The highest level for which tests have been used so far is for the work of general foreman, which corresponds to the rank of

superintendent with smaller firms. (A few businesses use test information in sizing up as high as vice presidents.) New tests are continually being tried out and validated by following up the success of employees on the job. Several original tests have been devised for specialized operations, but in general they use published and standardized tests.

A constant check is kept on the validity of the tests, for as a job operation is changed it may alter the abilities needed. The psychological technicians not only visit the working departments to see what the jobs are like, but also actually try the operations themselves to get the feel.

Reports of the studies made in local plants are circulated to the personnel technicians in all plants. Some of their recent reports were:

An interest sampler for reducing labor turnover
Tests for supervisory employees
Criteria for job success
Personal history items which predict turnover

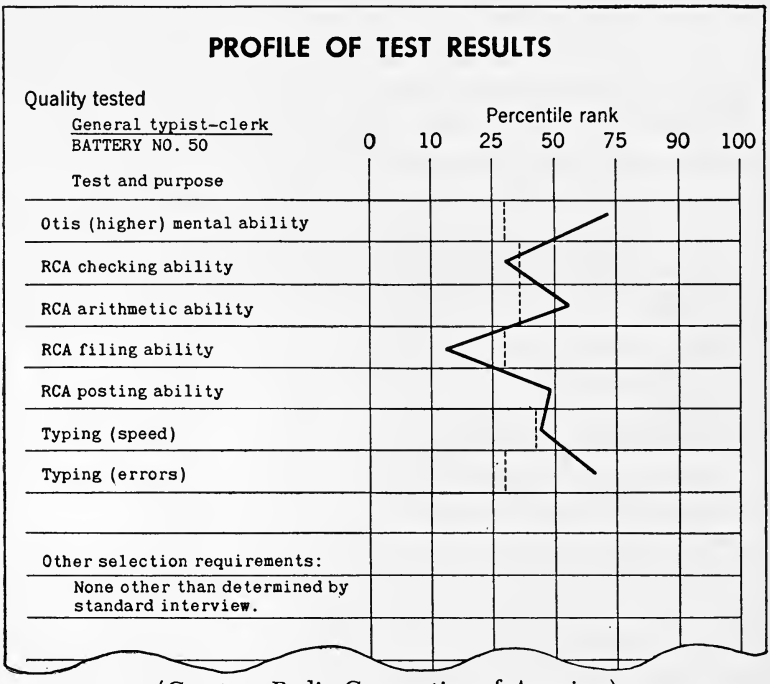
Many *occupational test batteries* have been covered by the RCA Victor interplant reports. A battery is a group of tests which has proved more useful to predict ability for a job than a single test. More than 50 batteries have been proved-in for various types of work, in both offices and plants.

The results of an applicant's testing is given to the employment interviewer in the form of a profile which shows the percentile standing in each test of the battery. The interviewer is also given the critical scores below which it may be risky to employ an applicant.

Battery No. 50, for general typist-clerk, and the profile of an applicant, is shown on the accompanying test report. The lower critical scores are marked by dotted lines. The 40 minutes needed to take this test battery reveal more about ability for this

work than is usually learned after an employee has been on the job several months.

As in most firms, applicants are not told their scores on the separate tests. Sometimes they are given some general vocational guidance. One boy who applied for routine benchwork was found to have high intelligence and high PEA. He was told



(Courtesy Radio Corporation of America.)

about his possibilities and advised to finish high school during evenings, and then to take some technical courses. He now has work of higher grade and pay than he had ever dreamed possible for him.

Foremen are not told an employee's test scores unless the foreman asks for the information and has a background that will

enable him to understand them. But these foremen have been reading up on "human engineering" to understand what the tests mean and to add to their skill in sizing up people. They consult more and more with the personnel psychologists about special problems and have become sold on the tests since they have seen demonstrated the higher abilities of those workers who are selected according to test information.

"In selecting employees for work we are interested in getting people who will do the work well, who can be expected to stay on the job, who will be satisfied employees, and who have a reasonable potential for development," says the RCA Victor Personnel Testing Guide. "A man who has the right combination of qualities needed on a job will be a good employee, where one who does not may do a poor job or become poorly adjusted. The problem of placement is to select individuals having qualities that most nearly match the combination required for the job."

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